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STEEL

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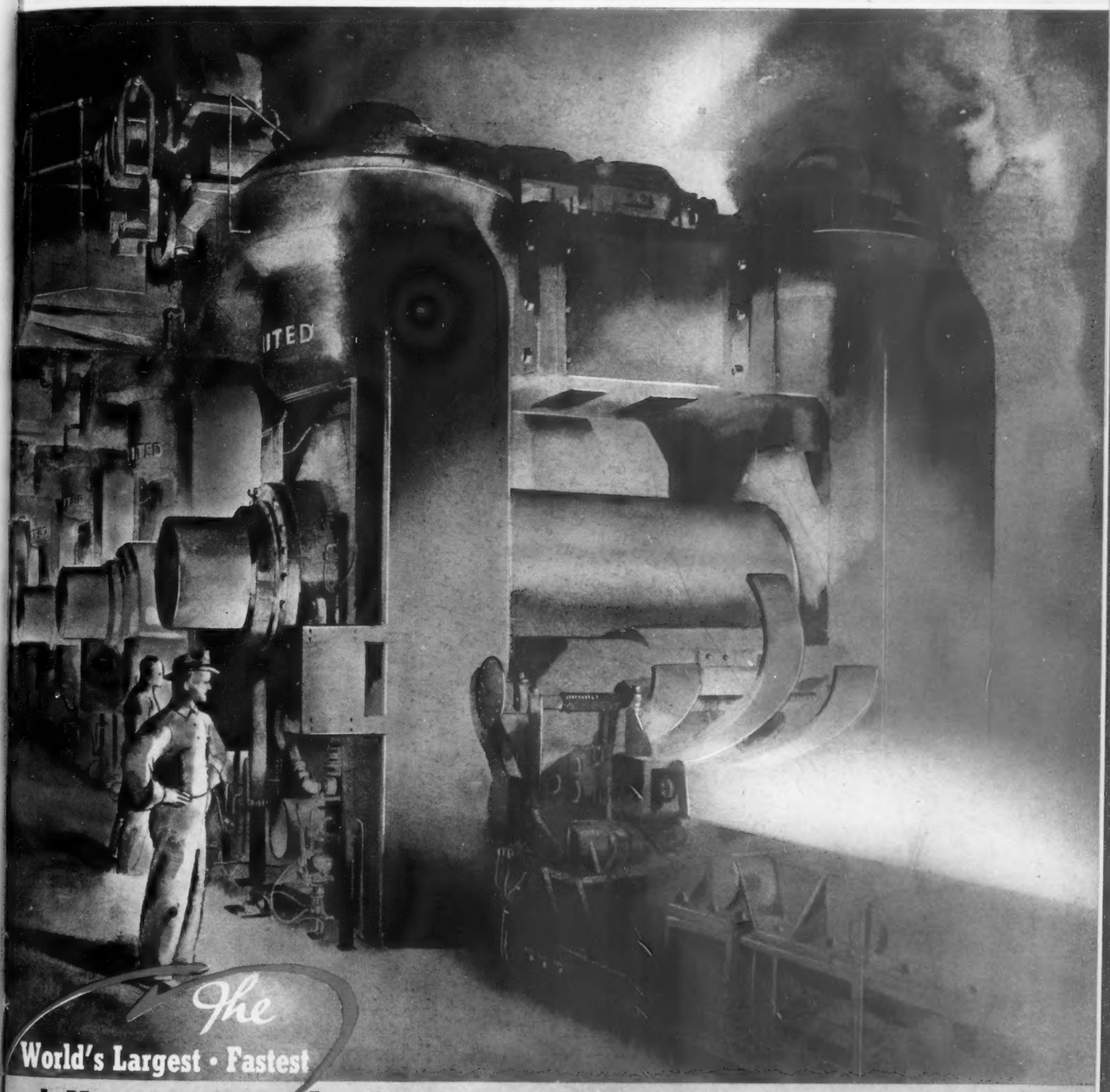
FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

MAR 28 1938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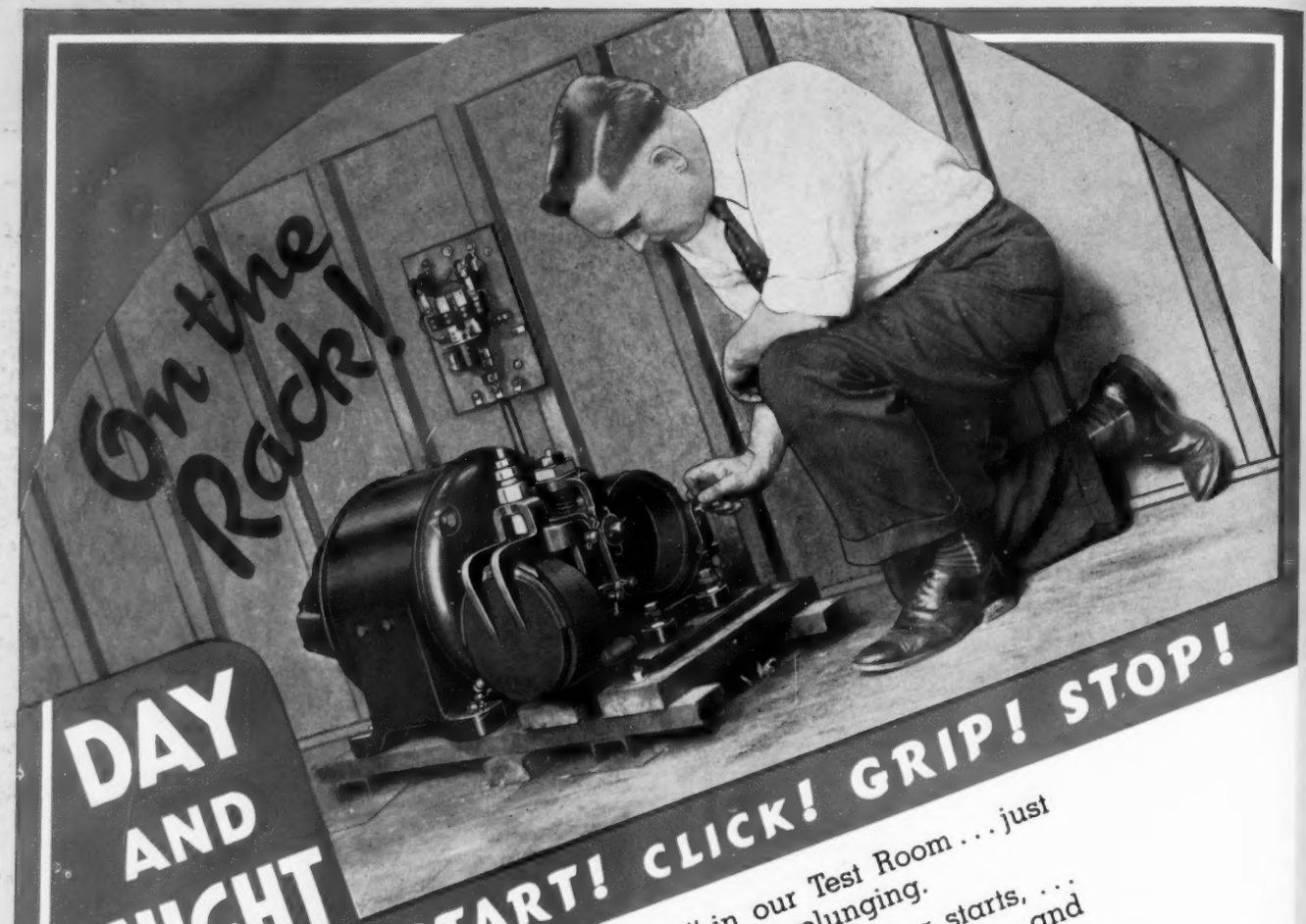

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Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

"Trade Must Be Balanced"

To the Editor:

The first letter in your Reader Comment of March 21 discussing effects of pig iron imports seems to show rather pointedly that so many of our manufacturers are still unable to appreciate that we cannot expect to export material unless in the long run we receive imports of approximately the same value. The United States has exported automobiles, typewriters, machine tools and we have even exported some pumps to England; in the final analysis the only way that we can be paid for these exports is by means of a balance in trade.

If the "Eastern Merchant Pig Iron Producer" had his way and stopped the importation of pig iron from the United Kingdom, it would not help in the slightest to carry the relief load he mentions, as automatically our exports would be decreased to at least the same extent.

It seems to us that Secretary Hull is entitled to the thanks and appreciation of the entire manufacturers fraternity for his balanced efforts to eliminate unnecessary tariffs and other barriers from the normal flow of trade. He will succeed in making living better for us and for countries abroad and, we believe, somewhat eliminate the distrust between other countries and ourselves.

But the main feature is that it is discouraging to read letters showing a lack of appreciation of the necessity of approximately balancing imports and exports.

Last year the writer endeavored to bring from England some pocket knives to be given away as souvenirs and on a knife costing us 40 cents we found the duty would be 45 cents or 112 per cent. This contrasts with the duty on our product going into England of 25 per cent. The knives were returned to England.

It does not seem sensible for us to maintain an exorbitant tariff when the actual effect is, first, to stop the importation of some of these foreign goods and consequently to stop the exportation of American goods to balance the importations, and second, to make other countries feel that we are most unfair and that our talk about "good neighborliness" is just "Yankee bunk." The only gainers are the increased political and customs employes who, we submit, would be better employed producing something for actual use by others.

A. S. MARLOW

Marlow Pumps,
Ridgewood, N. J.

Unions vs. Ambition

To the Editor:

If the article, "Opportunity's Door Open," by Jonathan Kludt, under Reader Comments in STEEL, March 14, could be placed in the hands of every employe in the United States, showing what ambition, purpose, application, perseverance and bility in an uneducated foreigner can accomplish, compared with the accomplishment of the union with only its seniority and equal (?) rights, it would have a wonderful effect.

Where are the straw bosses, foremen, superintendents, managers and executives of the future generation to be recruited from with the deadening effect on ambition and ability as advocated by universal union domination?

E. L. MESSLER

President,
Eureka Fire Brick Works,
Pittsburgh.

Let's Go After Business

To the Editor:

"Serious Note" published in your March 7 issue under "Behind the Scenes with Steel" struck a responsive chord in me and gave support to the convictions I have fostered for the past two or three months.

My analysis of the overall 1938 situation (and I am not sticking my neck out as an economist), arrived at after skipping around the country and poking my red nose into many phases of the steel industry as well as other industries, checks within a percent or two of the steel executives' analysis quoted in "Serious Note."

Fear breeds lack of confidence and God knows that plenty has happened to give us the jitters and keep our minds bouncing in and out of equilibrium. However, I am afraid that most of us have jittered ourselves into a state of hypochondria instead of a state of mind. Our status is not now all "beer and skittles" but neither is everything "rotten in Denmark." Where there's life there's hope, so let's discard our shackles of fear and let the road to the psychopathic ward and the poor house grow green with weeds.

After all, if 1938 can produce 75 per cent of 1937's business—and it can do that at least—is not that something? Surely it is and most certainly will keep industry out of the bread line. This country is bulging with backlog demand. Considerable of that backlog demand is right now peeping out of its hiding place, sniffing about to get the lay of the land. I believe that much of it will not go back into hiding. If it is allowed to go back into its hole, something is wrong with our industrial spine and we will have earned our splashes of red ink and

(Please turn to Page 91)

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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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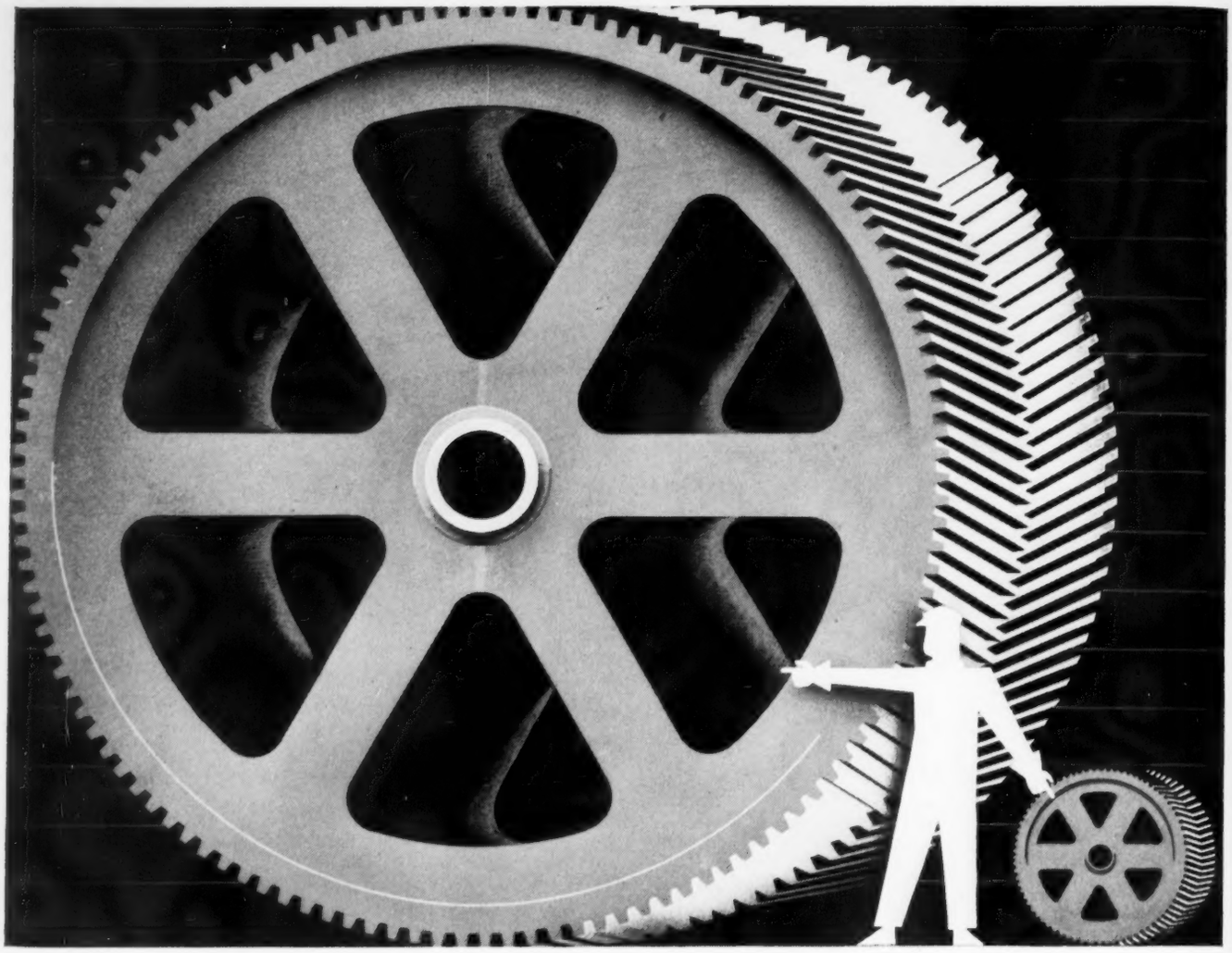

DIFFERENT IN SIZE . . . ALIKE IN STEEL

It's a big jump from a 36-inch gear to one of 16 feet weighing 53,000 pounds. Yet their case histories show that such widely varying sizes can be handled with one steel. In these instances a Manganese-Molybdenum (0.15 to 0.20% Mo) steel was used.

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As the Editor Views the News

■ LAKE ore shipments this season (p. 21) are expected to aggregate only 25,000,000 to 30,000,000 tons. Iron ore at lower lake docks and furnaces March 1 totaled 37,000,000 tons, one of the largest carryovers in history. This compares with 22,000,000 tons a year ago. The ore picture has a bright side. Records show that a season with heavy ore shipments in the early months and light at the close usually is followed by one which begins slowly and ends in a rush. Such a trend is expected by steelmakers this year. One important steel producer is preparing for 100 per cent steel production early in 1939. . . . News of the past week was mildly cheering. Steel ingot production (p. 23) moved up 3 points to 35 per cent, as predicted by STEEL several weeks ago.

• • •

Report to Employes

Many metal producing and metalworking companies which hitherto have issued annual reports only to stockholders have begun the practice of presenting such reports (p. 18) to their employes. They give jobholders a clear picture of where the company's dollar comes from and where it goes. Included are descriptions of activities and explanations of policies. The reports denote recognition that the interests of employer and employe are interdependent, also that the place of the jobholder is on a plane with that of the stockholder. . . . Last week an English delegation arrived in this country (p. 22) to study American steelmaking practice and particularly our continuous flat rolling mills. It was made up of manufacturers and representatives of British organized labor.

• • •

May Be Significant

No country reduces its iron and steel production when it is about to go to war. Several blast furnaces in England (p. 22) have been blown out during the past few weeks. In addition, the former higher import duties on imports of certain iron and steel products (p. 33) have been restored, effective April 1. These developments are regarded as signs of England's peaceful intentions. . . . Attendance at the third Western Metal congress and exposition, at Los Angeles last week, exceeded expectations (p. 15), numbering 33,000. About 150 exhibitors participated. . . . Iron and steel exports in February (p. 27) continued high, exceeding those of a year ago by 46 per cent in volume and 28.5 per cent in value. . . . Certain departments of the huge new Irvin works (p. 19) now are in trial operation.

• • •

High Speed In New Mills

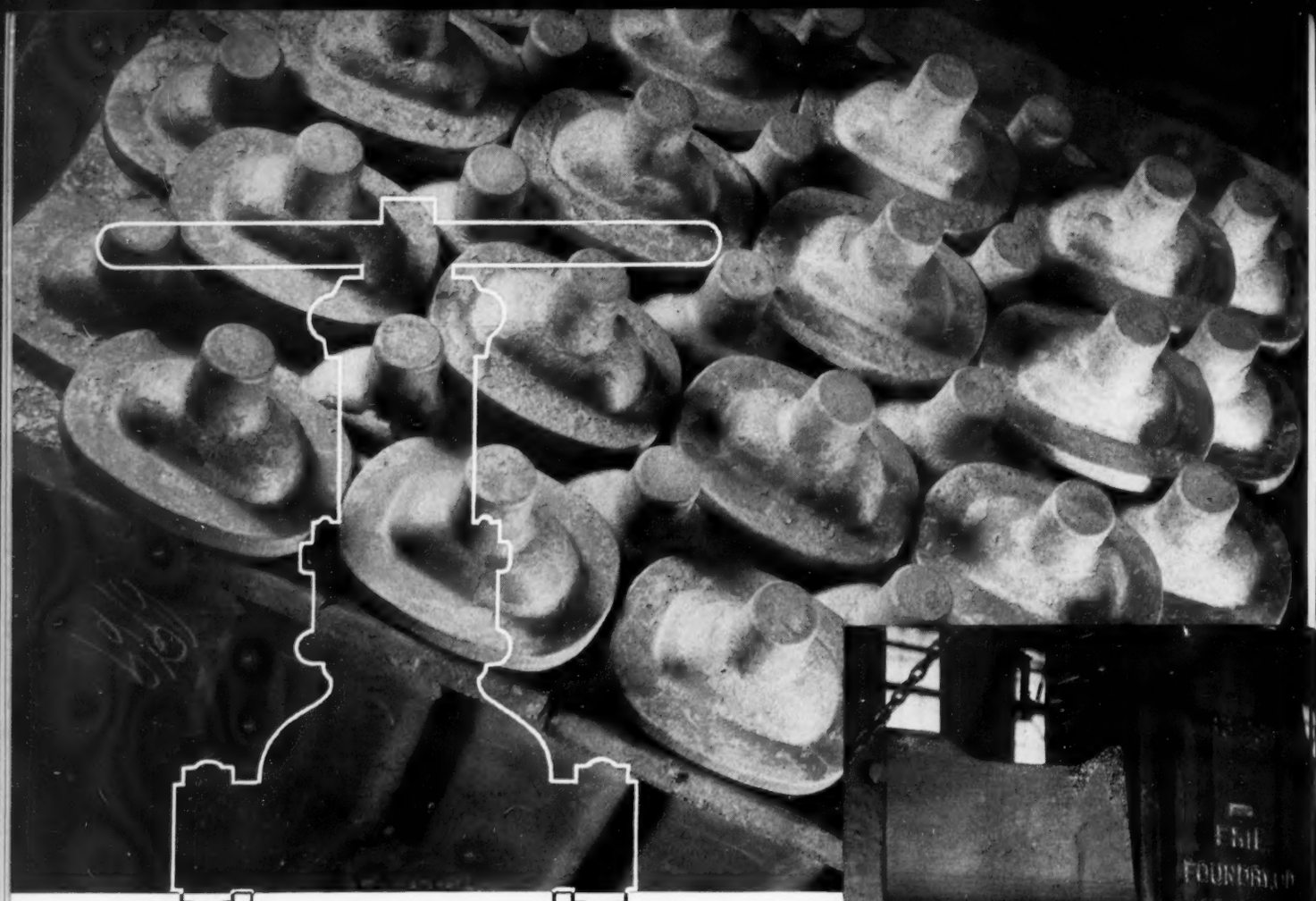
Attending the rapid growth in production and consumption of strip steel has been the development of auxiliary equipment which facilitates effective use of this material. New high speed side trimming, slitting and processing machines (p. 42) are provided with two or more drums which are swung into line as required to keep pace with the production of continuous rolling mills. . . . Great ingenuity has been applied in recent years to the development of special fastening devices which permit effective and economical assembly of metal products. One such fastening (p. 46) has been produced in more than 250 designs and a new plant has been equipped for its manufacture. . . . Unusually clean, sound, tough steel is being obtained (p. 58) with a new grain refiner.

• • •

Doubles Production

Wise managements continually scrutinize their production methods for possibilities for improvements and economies. Using a new press welder to join legs to a washing machine stand (p. 51), one manufacturer has more than doubled production on this work. . . . Proper utilization of scrap presents opportunities for important economies in stamping plants. In carrying out an expansion program an Eastern manufacturer (p. 65) has made provision for unusual savings. An adequate materials handling system permits straightline production method. . . . Increased life of galvanizing kettles and lower costs and dross loss are obtained (p. 52) with carefully designed furnaces utilizing impact firing. . . . Present tests to determine friction losses in lineshafts (p. 60) yield questionable results.

E. L. Shaner



No Spoilage Making Valve Bonnets of Inland Forging Bars

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Inland produces a wide range of forging quality and other special quality and special analysis bars—bumper sections, silico-manganese steel for springs, cold drawing bars, etc.

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Thirty-three Thousand Attend Western Metal Congress and Exposition

■ METALWORKING industries of the Pacific Coast joined forces last week in Los Angeles to attend the third Western Metal congress and exposition and thereby to make it a most successful undertaking.

This event, March 21-25, was patterned after two similar gatherings in the West, the first in Los Angeles in 1929 and the second in San Francisco in 1931, and served to focus attention upon progress in the fabrication and use of metals, as does the annual congress and show in the East.

Attendance at the Metal exposition in Pan-Pacific auditorium exceeded expectation with more than 33,000 visitors passing through the gates during the week, with a peak of 10,000 on the third day. Here nearly 150 manufacturers of iron and steel and nonferrous metals, and equipment and supplies used in the fabrication and processing of metals, were represented with exhibits of their newest products.

American Society for Metals was the chief sponsor of the congress and exposition, this organization holding technical sessions morning and afternoon of the five days. American Welding society, American Society of Mechanical Engineers and Pacific Coast Gas association were among the principal cooperating groups, West Coast sections of each conducting their own meetings in connection with the congress.

Many Organizations Co-operate

Other participating groups included the American Ceramic society, American Chemical society, American Foundrymen's association, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Petroleum institute, American Society of Civil Engineers, American Society for Testing Materials, Chamber of Mines and Oils, Institute of Aeronautical Sciences, Metal Trades and Manufacturers' association, Mining Association of the Southwest, National Association of Purchasing Agents, Pacific Coast Electrical association, and Society of Automotive Engineers.

Total registration for the congress was about 2000, with the American Society for Metals accounting for 1000; American Society of Mechanical Engineers, 400; and American Welding society, 225. Some 85 technical papers were presented at 28 sessions. A wide field of subjects was covered, the major ones being petroleum; melting, smelting and relining; aeronautics; foundry practice; machinability; fuels; management; hydraulics; and applied mechanics.

All meetings were exceptionally well attended. Morning sessions of the American Society for Metals were at the Biltmore hotel, afternoon sessions at the Pan-Pacific auditorium where the exposition was staged. Other organizations confined their sessions to the Biltmore.

One of the features of the congress was a lecture course on "Fundamentals of Ferrous Metallurgy" conducted on five successive evenings and open to anyone interested. These lectures, conducted by Dr. A. Allen Bates, manager of chemical and metallurgical department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., attracted an average attendance of approximately 450.

Average attendance at sessions of the American Society for Metals was 225. At the opening session, John Disario, metallurgist, Columbia Steel Co., Torrance, Calif., chairman of the Los Angeles chapter and general chairman of the congress committee, made an address of welcome. National President Dr. George B. Wa-

First West Coast Metal Show in Seven Years

■ **Interest was high at the third Western Metal exposition in Los Angeles last week. Pan-Pacific auditorium was filled with the exhibits of nearly 150 manufacturers located throughout the United States**

terhouse, professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass., made the reply.

Special low-alloy high-tensile steels recently introduced for light-weight construction possess a combination of desirable properties never anticipated in low cost steels, declared A. F. Stuebing, railroad mechanical engineer, United States Steel Corp., New York. Manufacturers and users of many types of equipment and structures see new possibilities of accomplishment with these materials. In actual practice, designers have found that by the use of high tensile steel, equipment can be made substantially lighter and yet withstand the impacts of service. Recent designs have resulted in fast train schedules and light freight cars.

The same economic factors apply also to water transportation, Mr. Stuebing declared. Life of high tensile steel is two to four times that of plain steel. The new steel has high abrasion resistance and is standard for mining equipment. In structures, high tensile steels have made possible savings in weight of 30 per cent, thus frequently affording the only means by which progressive engineering and economic objectives of modern industry can be attained.

No Move To Standardize

Replying to questions, the speaker said no attempts have been made to standardize these steels to reduce the number on the market. Low temperature impact tests have been made on these materials and results were satisfactory.

A method for rapid determination of frictional wear of lubricated metal surfaces was described by C. J. Coberly and F. M. Arnold, president and metallurgist, respectively, Kobe Inc., Los Angeles. The testing machine reciprocates test samples under load in an oil bath. Samples are prepared by lapping optically flat. The small amount of wear which occurs in a few hours is measured by the refraction pattern produced between the worn surface and an optical test plane. An electrical gage and the profilograph also are used in measuring wear. Nitrided materials are described as being extremely wear resistant. The method has been used to determine comparative lubricating values of a few light refined oils.

Every industry benefits directly or indirectly by some use of hard facing materials, declared C. C. Pendrell, Haynes-Stellite Co., Kokomo, Ind., in discussing new developments and applications of these materials. There are five groups of true hard facing materials of widely different compositions. Most significant development in these alloys has been to increase toughness. Many equipment manufacturers have standardized application of the materials before marketing them, consequently hard facing is become more and more a production process.

Dealing with metals used in petroleum production, H. W. McQuaid, assistant chief metallurgist, Republic Steel Corp., Cleveland, called attention to considerations other than analysis which affect the life of tools. Metallurgical factors in the selection of steel for oil production equipment usually are treated in an elementary way, he said. Principal considerations are the relationships between carbon content, hardenability control, hardness and toughness. Closer co-operation between the designing engineer, the production division and steelmaker was urged.

The engineer in the pipe line industry must have intimate contact with a wide variety of materials, asserted L. F. Scherer, assistant chief engineer, Texas Pipe Line Co., Houston, Tex. First successful pipe line was built in 1865 and consisted of wrought iron pipe. In 1919, welding of joints into a line of any length was introduced. Use of steel pipe, however, is comparatively new. Choice of the type of pipe is based on service life required, class of service, availability, freight and handling costs.

In discussing the theory and practice in pipe protection, Dr. G. N. Scott, pipe line technologist, Los Angeles, pointed out that soil corrosion is a problem of vast economic importance. He presented new information on electrical aspects of corrosion and assembled facts and theories for which quantitative expressions can be given. Exterior manifestations of corrosion are essentially electrical, varying from undetected circuits to circuits covering many miles of pipe.

R. L. Wilson, metallurgical engineer, Climax Molybdenum Co., Canton, O., presented a paper on the behavior of steels under stress at elevated temperatures, with special emphasis on the different character of the deformations at temperatures below and above the lowest temperature of equi-cohesion. At temperatures below the equi-cohesive temperature the short-time tensile test is regarded as a satisfactory basis for reliable designs, while at higher temperatures it is advantageous to select materials and calculate designs on the basis of some strength value determined in long-time tests. The speaker discussed tensile creep tests and long-time tensile rupture tests as a means of evaluating the high-temperature strength of steels.

Describe Results of Tests

Another paper on the same subject, prepared by A. E. White and C. L. Clark, director and research engineer, respectively, department of engineering research, University of Michigan, Ann Arbor, Mich., and W. G. Hildorf, chief metallurgical engineer, Timken Roller Bearing Co., Canton, O., stressed the various ways in which data from the stress-rupture test can be used for determining high temperature character-

"Metals in Industry" Is Exposition Theme

■ **Exhibits in the Western Metal exposition included iron and steel and nonferrous metals, furnaces, fabricating and processing equipment and supplies used in heat treating and finishing metal products**

istics of a given steel. Among the characteristics revealed by the test are the load-carrying ability, and the influence of time, temperature, stress and atmosphere on the structural and surface stability.

The paper, read by Mr. Hildorf, also showed that in many cases a rather definite relationship exists between the stress-rupture and creep characteristics. Other possible applications of the stress-rupture test were likewise considered among which are its ability to classify steels of the same general type with respect to their load-carrying ability, to serve as a possible acceptance test, and to indicate the relative degree of strain hardening.

A summary of metallurgical autopsies performed on refinery still tubes which had failed in service during the past 20 years was contained in a paper prepared by E. C. Wright, chief metallurgist, National Tube Co., Pittsburgh, and H. Habart, Ellwood City, Pa., works of the same company. Analysis of the investigations showed that failures fall into definite classes.

High temperatures employed in cracking petroleum, high temperatures and pressures in thermal polymerization of hydrocarbon gases, and refining of the more corrosive crude oils are factors which have been responsible for the evolution of a number of new alloy steels for process coil tubing in oil heating furnaces, declared R. L. Wilson, metallurgical engineer, Climax Molybdenum Co., Canton, O. The speaker described the effect of the various useful alloying elements on corrosion, oxidation, high temperature strength, and air hardening of refinery tube steels, and classified many of the newer compositions according to their serviceability.

Welding Society's Progress Raises Important Questions of Policy

■ AMERICAN Welding society opened its Western regional conference officially when national and division officers met at luncheon on March 21 to greet National President P. G. Lang Jr., engineer of bridges, Baltimore & Ohio railroad, Baltimore, and Convention Chairman E. F. Scattergood, bureau of power and light, Los Angeles. About 75 attended.

Mr. Lang reviewed the phenomenal progress made by the society in the last two years, and declared the time has come to decide certain important policies for the future. Membership, he said, probably is now sufficient for a successful technical society, confining its aims principally to engineering matters. If, however, desirable promotional activities concerning the art and business of welding are to be pursued, a considerably larger membership and income will be necessary.

Applications and proper uses of hard facing materials was discussed in one technical session. Presenting a paper on this subject, Don Llewellyn, Air Reduction Sales Co., New York, was impressed by the ability of nature to throw silt-laden flood waters against a river bank, even protected by strong concrete walls, and to scour out foundations of everything in its path. Similar man-made conditions exist in cutter heads, pumps and pipe lines at such places as the construction plant at Fort Peck, Mont.

Four dredging units, each with five pumps, are moving 1,000,000 cubic yards of gravel into the body of the dam every week. They pump these solids, mixed with four times the volume of water, through 28-inch pipe lines to the required place. Only generous use of hard facing materials, welded on cast iron and steel surfaces, enables this equipment to withstand the intense abrasion any length of time.

Mr. Llewellyn emphasized that well over a dozen varieties of hard facing materials are now available and these can roughly be classified into three groups. First in durability and highest in expense come the hard carbide and boride particles, either cast to shape or in crushed fragments, fixed to the cutting edges of drill bits, digger teeth, and such like with a little tough metal. Next are cast alloys, intrinsically hard, used as filler metal. Finally are the alloy steel welding rods, used where the service is least severe and where large areas must be covered, either to resist abrasion, cavitation or corrosion.

Applications are so various—ranging all the way from crusher surfaces, shear blades, hot-metal guides, water wheels, digger points—that definite application should be considered carefully in advance by a competent representative of the welding equipment manufacturer, so that the correct material and the correct procedure during preparation, application and finishing may be chosen.

Far from being merely a repair job—although even as repairs the hard facing process is making noteworthy savings—many manufacturers of heavy-duty equipment put hard facings on all parts where wear will undoubtedly be excessive, the speaker said. These range all the way from enormous turbine vanes to small gas engine exhaust valves—the latter, for instance, being standard practice for truck engines.

T. B. Jefferson, associate engineer, United States engineer's office, Fort Peck, Mont., and who is in charge of the shops at the construction plant for Fort Peck dam, supplemented Mr. Llewellyn's paper by giving instances where welding is an important aid in keeping contractor's equipment in operating order. He pointed out that welding for repairs is increasingly valuable as the part to be repaired is more and more inaccessible—either geographically or mechanically. In the first case, a rapid repair will save a costly delay in obtaining a new part; in the second case, a costly dismantling and reassembly job. Since welding equipment is readily portable, it is a matter literally of bringing the small shop to the big job—where, for instance, a steam shovel or a locomotive is in trouble.

"Delays in operation," remarked Mr. Jefferson, "usually are of much more importance than actual cost of repairs. As a rule, the latter is of concern only to the master mechanic, as his efficiency is judged principally by this record. However, when a machine breaks down on the job, resulting in serious operating delay, everyone is concerned, for production stops and operating costs continue, profits are reduced and penalties sometimes incurred."

Making Job Welding Pay

The "job shop" or "weldery" has, in its ideal state, the same relation to the industrial life of its community as the central repair shop of a large undertaking, in the opinion of J. C. Gowing, J. C. Gowing Co., Huntington Park, Calif. His paper on helping the job shop welder emphasized principles that should govern location and business operations, once started. Mr. Gowing was especially insistent that a sound accounting system be maintained by the shop.

Actual work, of course, will vary with the chief activities in the community served; obviously a waterfront shop and one in an oil field will meet different problems. The really successful shop eventually becomes a production plant in addition to a repair center—Mr. Gowing cited one in an agricultural center which made over 100 trailers for hauling stock to market, selling them for $350 each, of which 50 per cent was profit.

"Annual Report to Employes" Now Supplements That to Stockholders

■ INCREASING attention is being paid by steel and metalworking companies to keep their workers informed on their business affairs.

Up to a few years ago annual reports were made by the majority of these companies only to stockholders. Now much of the same information is presented in annual reports to employes, with additional facts of most concern to those employes. So many companies have adopted this plan, in some form, this spring it is impossible to list them.

Generally included are simplified financial statements. Often illustrated by charts, these give jobholders a clear picture of where the company's dollar goes—wages, materials, taxes, reserve and dividends. Also included are activities and explanation of policy on vacations, pensions, relief, saving and stock ownership plans, homebuilding, safety and first aid.

"While the annual reports to stockholders are customary, the report to employes on matters of joint interest has been accepted as an innovation that fills a real need," says E. G. Grace, president, Bethlehem Steel Corp., in the foreword to this year's report to employes.

"I believe the great majority of employes are still interested in the same things they always have been interested in; namely, security of their jobs, equitable wage rates, good supervision, protection against the hazards of disability and old age, and a basis for fair dealing founded upon mutual confidence."

Bethlehem made its first annual report to employes July 6, 1927, and has continued since.

United States Steel Corp. relays information to employes, among other means, through *US Steel News*. A series of three articles entitled "How We Earn Our Living," "Who Pays Wages," and "Who Pays the Taxes," recently attracted wide interest, was reprinted in newspapers and magazines.

Emphasize Interdependence

Weirton Steel Co. in its monthly *Employes Bulletin* reports to workers on matters of mutual interest as they arise. Youngstown Sheet & Tube Co. and others follow a similar practice.

Still other companies keep employes informed by letters dealing with specific issues. This was practiced widely by independent companies before and during the steel strike last summer.

Although some steel companies for several years have followed the practice of confiding to employes information that once was considered only the business of management and stockholders, other industries are adopting the policy.

Benefits claimed: It impresses on workers that the interests of capital and labor are interdependent; it makes for better labor relations by elevating labor's contribution to a plane comparable to the stockholders'.

Most reports emphasize distribution of money received—that the bulk is used for wages and materials. Charts depict graphically how the worker's position has improved, how his wages have increased, compared with living costs, selling price of product, dividends, etc.

Recent reports to employes, as well as to stockholders, have pointed to the sharp increase in the tax burden. *US Steel News* says: "During the 1928-1936 period, U. S. Steel, after paying $77,000,000 as interest on bonds, had left over for the owners only the sum of $364,000,000. During this same period it paid out $2,502,000,000 in wages.

"The taxes paid during this period were $379,000,000. That is, the units of government, which had put no savings into the properties and had taken no risk, received $15,000,000 more than the owners, who ventured their savings and thereby created two and a half billion dollars in wages."

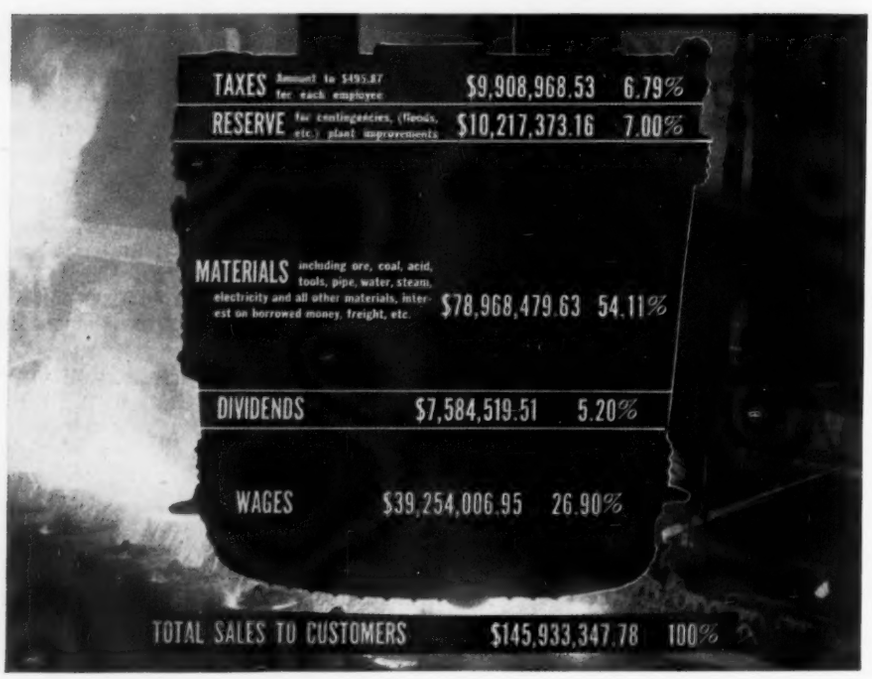
Bethlehem cites its taxes have increased from $6,123,410 to $19,687,125 in the last three years.

"Related to employment our tax bill in 1937 would pay a year's wages to almost 12,000 employes. In the last analysis productive jobs are the only real cure for unemployment and jobs are made available when industry is thriving and encouraged to expand. Anything, therefore, that places a burden on industry undermines the job," declares Mr. Grace.

In a report to jobholders, which coincides with the annual report to stockholders, Johns-Manville opens its books to employes in a simply-worded, illustrated financial statement for 1937.

Lewis H. Brown, president, states average employment was 11,242 persons, 15 per cent more than in 1929. Salaries and wages totaled $20,354,-

Dramatizing Financial Statements for Employes


TAXES Amount to $495.87 for each employee $9,908,968.53 6.79%
RESERVE for contingencies, (floods, etc.) plant improvements $10,217,373.16 7.00%
MATERIALS including ore, coal, acid, tools, pipe, water, steam, electricity and all other materials, interest on borrowed money, freight, etc. $78,968,479.63 54.11%
DIVIDENDS $7,584,519.51 5.20%
WAGES $39,254,006.95 26.90%
TOTAL SALES TO CUSTOMERS $145,933,347.78 100%

■ Weirton Steel Co., subsidiary of National Steel Corp., prints in the current issue of its *Employes' Bulletin* a full-page, 11 x 14 inches, illustration depicting a scene in its steel plant. Caption over the top reads: "What Happens to the Money Collected from Our Customers? From the National Steel Corp.'s Annual Report to Stockholders for 1937." The ladle is subdivided proportionately with figures showing taxes, reserves, materials, dividends and wages.

000, 26 per cent more than in 1936. Sales amounted to $60,173,000, 23 per cent above 1936.

Average hourly wages increased 11 per cent over 1936, were 9 per cent above 1929 and 30 per cent above the 1933 depression low. Wages and salaries accounted for 51 cents of every dollar the company received for the value it added by manufacturing raw materials into finished products. Dividends took 11½ cents, depreciation and depletion 6 cents, research 1½ cents, reserve 2 cents, taxes 5 cents, and all other expenses 23 cents.

Jobholders with the company more than six months shared in distribution of more than a quarter of a million dollars extra compensation at Christmas.

Merger in India, To Make Electric Steel Castings

■ Mukand Iron & Steel Works, Bombay, India, has been formed by merger of Mukand Steel Rolling Mills, Mukand Iron Works and Mukand Steel Foundry, all located at Lahore, and Hindustan Iron & Steel Products Ltd., Bombay. Capital is 5,000,000 rupees (about $3,000,000).

The plants will be expanded and two electric steel furnaces have been purchased, one for Bombay and one for Lahore, with daily capacity of 16 to 20 tons each. Electric steel castings will be manufactured to meet demands for railroad and government construction.

1938 Excels in One Way—Heaviest in New Continuous Sheet, Strip Capacity

■ DESPITE the recession, more capacity for rolling sheets and wide-strip steel on continuous mills is being brought in this year than in any other year since the continuous rolling process was developed. The new mills were projected in 1936 and 1937.

Completed recently are Republic Steel Corp.'s 98-inch mill, Cleveland, with 800,000 tons annual capacity; and Tennessee Coal, Iron & Railroad Co.'s 48-inch mill, Fairfield, Ala., 360,000 tons.

Under construction are Carnegie-Illinois Steel Corp.'s 85-inch mill, Irvin works, near Clairton, Pa., 720,000 tons; and Inland Steel Co.'s 44-inch mill, Indiana Harbor, Ind., 320,000 tons.

Ford Motor Co. has scheduled the widening of its continuous strip mill, adding 75,000 tons to its annual capacity. Otis Steel Co. is widening its mill, with similar increase in capacity.

The total 2,350,000 tons compares with tonnages for continuous rolling mills brought into service in prior years:

	Net tons		Net tons
1937	1,400,000	1931	720,000
1936	2,519,000	1930	400,000
1935	2,206,000	1929	540,000
1934	None	1928	372,000
1933	None	1927	1,554,000
1932	1,350,000	1926	312,000

The figures for 1936 include 729,000 tons represented by a semicontinuous plate mill for Carnegie-Illinois Steel Corp., Homestead, Pa. Plates rolled on this mill may overlap into some of the heavier gages rolled on continuous strip mills, but the mill does not fall into the identical classification as those mills.

Twenty-five continuous mills, including Republic's and Tennessee's new units, now are operating or available for operation.

With the completion of the Irvin works, Inland's mill, and the Ford and Otis enlargements, total capacity of all such mills in the United States will be 13,723,000 net tons annually. This is nearly 30 per cent of the industry's entire capacity for finished rolled steel.

Combined cost of the four new mills and two enlargements is estimated as $140,000,000, bringing the total invested in such mills to $500,000,000.

Irvin Works Almost Completed

The speed at which modern steel mills are erected is exemplified in the $60,000,000 Irvin works. First earth was turned May 22, 1937, by William A. Irvin, then president, now vice chairman, United States Steel Corp., in whose honor the plant was named.

First steel was erected July 8, and within a week or ten days the roof was being put on the first building.

First equipment, a crane, was in place and in operation Nov. 23.

First rolling mill equipment, a 42-inch, five-stand tandem type cold reduction mill, was operated March 2.

First tin plating equipment was operated, on test basis, March 15.

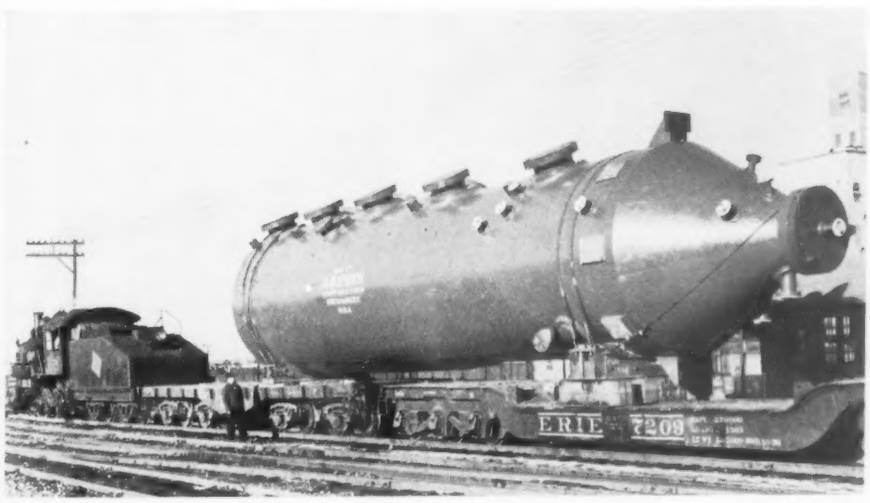
Portions of the plant equipment that already have been given tests or are about ready to go include, in addition to the 42-inch cold reduction mill and tin pots, three temper pass mills, tin division shearing lines, annealing division, electrolytic cleaning process—continuous pickling—and the tin house.

Installation of all equipment is expected to be completed shortly after July 1.

Fifteen of the 19 principal buildings already are under roof. Structural steel for them totals 27,146 tons, of which 15,424 tons have been erected.

Electric power to operate will be purchased from a utility, transmitting current at 66,000 volts a distance of 11 miles. The plant will be powered by 1925 electric motors of 300,000 horsepower total. Five

Steel Pressure Vessel Dwarfs Locomotive



■ One of the heaviest pressure vessels ever built was shipped recently to Gulf Refining Co., Port Arthur, Tex., by A. O. Smith Corp., Milwaukee. It was the eighth shipped to the Port Arthur refinery by the company in three months. Weighing nearly 200 tons, this separating tower has overall length of 61 feet, outside diameter 12 feet, maximum wall thickness 3¾ inches. It is of electric-welded steel plate construction, and is lined with a corrosion-resisting, chromium alloy. Its size presented a difficult transportation problem

New York to New York, Via Birmingham, Chicago and Pittsburgh

■ United States Steel Corp. officials on their plant inspection trip last week. Left to right—Walther Mathesius, vice president in charge of operations, Delaware corporation; J. Carlisle MacDonald, assistant to Mr. Taylor; J. L. Perry, president, Carnegie-Illinois Steel Corp.; Benjamin F. Fairless, president, U. S. Steel; E. R. Stettinius Jr., chairman of the finance committee, who will succeed Mr. Taylor as chairman of the board, April 5; E. M. Voorhees, vice chairman, finance committee; W. A. Irvin, vice chairman, U. S. Steel; and Myron C. Taylor. Mr. Mathesius joined the group at Chicago

of these motors will be 10,000 horsepower each.

Four thousand men and women will be employed when operations are at capacity. Estimated earnings of hourly wage employes on a capacity basis and at current rates, follow:

$5 per day or less	*338
5 per day to 6	967
6 per day to 7	850
7 per day to 8	1,000
8 per day to 9	400
9 per day to 10	300
10 per day to 20	142
Over $20	3
Total	4,000

*Includes 150 girls at $4.48 per day.

Parking facilities for employes will accommodate 3000 automobiles.

The 44-inch slabbing mill at Carnegie-Illinois' Edgar Thomson works is about 60 per cent completed and is expected to be in operation shortly after Jan. 1. Distinctive equipment includes three open-hearth department cranes built to transport loads of 250 tons.

TAYLOR, NEAR CLOSE OF TEN-YEAR PROGRAM, VISITS MILLS

Major improvements in the United States Steel Corp.'s construction program in the Birmingham, Chicago and Pittsburgh districts were inspected last week by corporation officials.

Included in the group were Myron C. Taylor, who retires as chairman April 4; E. R. Stettinius, chairman of the finance committee, who will succeed Mr. Taylor; B. F. Fairless, president; William A. Irvin, vice chairman; E. M. Voorhees, vice chairman of the finance committee who will succeed Mr. Stettinius as chairman of the committee April 5; and J. Carlisle MacDonald, assistant to the chairman.

Concluding the survey at Pittsburgh, Mr. Taylor reaffirmed his confidence in the future of the corporation and the steel industry in America.

"This plant (Irvin works) is a very great evidence of our faith in the future. We are going right ahead with it, without any change in plans, despite the present recession. I couldn't say more if I talked for an hour."

To Mr. Taylor, last week's survey signalized virtual completion of his ten-year, three-fold program to revamp the corporation's production and financial setup, reorganize its personnel. Although he retires next week as chairman, he will continue a member of the board of directors and of the finance committee.

Win Advertising Award With Koppers Campaign

■ Ketchum, MacLeod & Grove Inc., Pittsburgh, and its client, Koppers Co., have won the annual advertising award for 1937 "for a campaign appearing in trade and professional publications which is distinguished for technical excellence and ethical soundness." The campaign was prepared for Koppers by the advertising firm.

Annual advertising awards were instituted by Edward Bok and were known then as the Harvard awards. They are now sponsored by *Advertising and Selling.*

Advertisers and agencies all over the country compete for these awards. More than 900 different campaigns embracing more than 10,000 advertisements, were submitted this year.

The Ketchum-Koppers campaign also received a certificate of merit from the American Institute of Graphic Arts.

Higher Carlot Rates Effective April 11

■ New freight rates on carlot steel shipments in the eastern territory will become effective April 11, railroads announced last week. Rates on less than carlot shipments become effective March 28, as previously announced (STEEL, March 21, p. 21).

From Chicago to destinations west of the Illinois-Indiana line, new rates on both carlot and less carlot shipments become effective March 28. On eastern shipments from Chicago, the new rates will be applied April 11.

Pennsylvania public utility commission has approved increases on iron and steel rates for intrastate movement comparable to new schedule on interstate hauls. On less carlots, new rates are effective March 28, and on carlots, April 11, in line with interstate schedules generally in official classification territory east of Mississippi and north of Ohio river.

Carload shipments of pig iron from the South, however, take new schedule March 28 in contrast with April 11 in the official classification territory generally.

A new fraction ruling on interstate carlot shipments will be applied. On rates less than 5 cents, all fractions under ⅛ will be dropped; fractions from ⅛ to ⅜ will take a ¼-cent; ⅜ to less than ⅝, ½-cent; ⅝ to less than ⅞, ¾-cent; ⅞ and above, 1 cent. On rates 5 cents to less than 10 cents, fractions of less than ¼ will be dropped; those from ¼ to less than ¾ will take a ½-cent; ¾-cent and above will take a full cent. On rates above 10 cents, all fractions under ½ will be dropped; ½ and above will take a full cent.

30,000,000 Tons, Ore Estimate; Expect Strong Late-Season Demand

■ CONSENSUS in the Lake Superior iron ore industry is that shipments this season will amount to 25,000,000 to 30,000,000 tons, depending on the degree to which steelmaking develops after July 1.

No date has been set for beginning navigation, the opening probably to be dictated by pressure for movement of coal from lower lake ports, where docks are becoming congested. When vessels reach upper lake ports with coal, ore will be loaded for the return. It is believed the coal movement will be started about April 15.

Recent launching of four cargo ships by Pittsburgh Steamship Co., subsidiary of the United States Steel Corp., each of 11,400 gross tons iron ore capacity, has enlarged the lake fleet's trip capacity by 45,600 tons to a total of 2,640,000 tons. Present estimates indicate about 40 per cent activity for the American fleet this season.

Stocks Largest Since 1932

Pittsburgh Steamship Co. will not send out its first ships earlier than May. It has been estimated about half its fleet may be in service by June 1. This company now has 79 ships with a trip capacity of 715,400 tons.

Iron ore at lower lake docks and furnaces March 1 totaled 37,000,000 tons, compared with 22,000,000 tons a year ago. Consumption of about 2,000,000 tons each in March and April, about the present rate, will leave 33,000,000 tons May 1. This compares with 14,500,000 tons at the corresponding date in 1937, and is the largest carryover ever made, except in 1932.

Computations on ore shipments are provisional and subject to change as the season develops. At this time they are based on the general opinion of steelmakers that there will be a strong rise in steel production late in the season. One important steel producer is shaping its plans to provide for 100 per cent steel production early in 1939.

Records show that a season with heavy ore shipments in early months and light at the close, is followed by one which begins slowly and ends in a rush. In 1937 shipments were heavy at the start, and declined in the last half. This year the start will be slow, and increased on indications of mounting steel activity.

Prices for this season have not been determined as there are no inquiries for tonnage. In 1937 they were advanced 45 cents a ton, the first in eight years. The price seems likely to be reaffirmed, it is said, in line with costs, which have not been reduced. Freight rates on ore carried by railroads at the head of the lakes were not increased last fall and no advances on ore were allowed in the interstate commerce decision this month.

AMERICAN MINE INTERESTS REASSURED BY MEXICO

American mining interests with properties in Mexico were reassured last week by President Lazaro Cardenas, who stated the government has no intention of expropriating the mining and other industries as it did the $400,000,000 oil industry.

Fearing seizure of its large iron ore deposits, Bethlehem Steel Corp., through its subsidiary, Las Truchas Co., recently obtained a temporary injunction in the federal district court in Mexico City. A date in June was fixed for a hearing on making such restraining order permanent.

Engineering studies and explorations have been made by Bethlehem over a period of years following the granting of a concession by a former government. Bethlehem has mined some ore, but has not shipped any.

Since 1931, Mexico has been the largest market for American goods among Latin-American republics. United States exports in 1937 amounted to $109,450,000, highest since 1930, and 44 per cent more than in 1936. The bulk of this gain was in "metals and manufactures" and "machinery and vehicles." These two classes in 1936 and 1937 averaged about 63 per cent of the total.

Important factors in the increase in 1937 were heavy purchases of equipment and supplies by agencies of the Mexican government, amounting to $10,000,000.

Prepares To Bid on 100 Steel Frame Houses

■ Rust Engineering Co., Pittsburgh, has erected in that city a steel frame "test house" of the Stran-Steel prefabricated type, framework of steel and walls of composite wood panels.

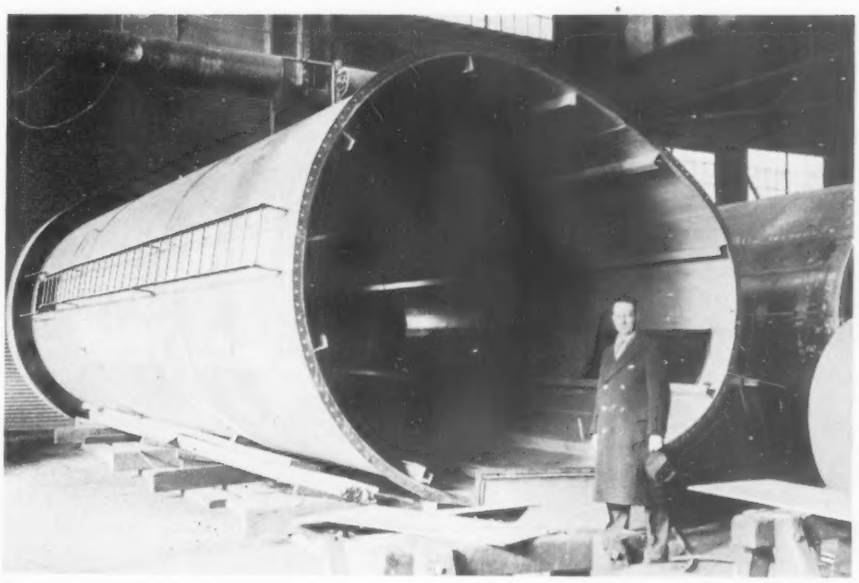
It did this to determine costs, to submit a bid for 100 similar houses to be erected in a West Virginia mining center.

This, it is reported, will constitute one of the largest commercial applications so far in the steel-house field.

The houses will be of the type developed several years ago by Stran-Steel Corp., Detroit, now a division of National Steel Corp., Pittsburgh, and specified by the owners.

For references to the Stran-Steel house see STEEL, April 3, 1933, p. 21; July 9, 1934, p. 23; Dec. 6, 1937, p. 82; and May 3, 1937, p. 24.

Ore Carrier Smokes a Big Pipe



■ **Welded smokestack 37 feet 3 inches tall for the WILLIAM A. IRVIN, one of four ore carriers launched in the past few months by Pittsburgh Steamship Co. They add 45,600 tons to the trip capacity of the fleet. About 50 miles of welding was done in fabricating the four. Photo by General Electric Co., which furnished welding sets, cable and electrodes**

Europeans Rush Rearmament, While Doubting War Is Near

■ REGARDLESS of top-speed rearmament programs, most Europeans do not believe a major war is imminent, according to Clifford S. Stilwell, vice president, Warner & Swasey Co., Cleveland, who last week returned from a business trip to England and the Continent.

General belief is that Germany will continue until she re-establishes the status quo before Versailles, and that England will not interfere as long as the British Empire is unmolested.

Rearmament programs, coupled with industrial expansion, assure a fairly high rate of European industrial activity for the next two or three years, said Mr. Stilwell. European countries will continue to import a heavy volume of American made products, although this may be 25 to 30 per cent under 1937.

Of machine tools, Mr. Stilwell said England is well equipped for the present rearmament and industrial program. England, Germany and Russia have made notable progress in building their own tools, although still under American standards. Japan and France have been unable to build superior tools and probably will continue a good market to American builders.

Shortage of skilled labor, in every country except Sweden, is retarding both rearmament programs and industrial expansion, according to Mr. Stilwell.

Especially interesting are the "shadow" plants owned by the British government but turned over to private industry to operate. These plants, said Mr. Stilwell, are modern and efficient, and are equipped for mass production of war equipment. Each "shadow" plant turns out parts only; assemblies are made elsewhere.

Mr. Stilwell noted that European sentiment, which generally has been favorable toward Roosevelt's "reforms," now tends toward a more critical and questioning attitude.

BRITISH EMPLOYER-LABOR GROUP HERE TO STUDY STEEL

A group of steel manufacturers and representatives of labor arrived in New York last week, to study steel production methods in the United States, especially continuous mills.

Included are H. P. Lloyd, Meath Steel Sheet & Galvanizing Co.; J. Bryden, Messrs. Smith McClean; and Donald Sankey, John Summers & Son, who heads the delegation; and John R. Wardell, Bert Sutcliffe, J. T. Richards and John Brown, all four being members of the Iron and Steel Trades confederation, British labor organization. Mr. Brown is general secretary of the confederation.

They plan to return to England early in April.

BRITAIN BLOWS OUT BLAST FURNACES; RAISES TARIFF

London — (*By Cable*) — Several more blast furnaces in Great Britain have been blown out due to accumulation of stocks. At the close of November, 135 stacks were operating; December, 133; January, 130; February, 124. Demand for pig iron is dull.

Import duties on iron and steel products into Great Britain beginning April 1 will revert to the former higher rates, but prices for domestic consumption will not be raised.

(For further information concerning the new tariffs see Windows of Washington, p. 33).

Steel specifications currently are fairly steady, especially for structurals.

The Continent reports steel markets unsettled because of recent political moves. Tendency of prices is slightly firmer, but sales are light.

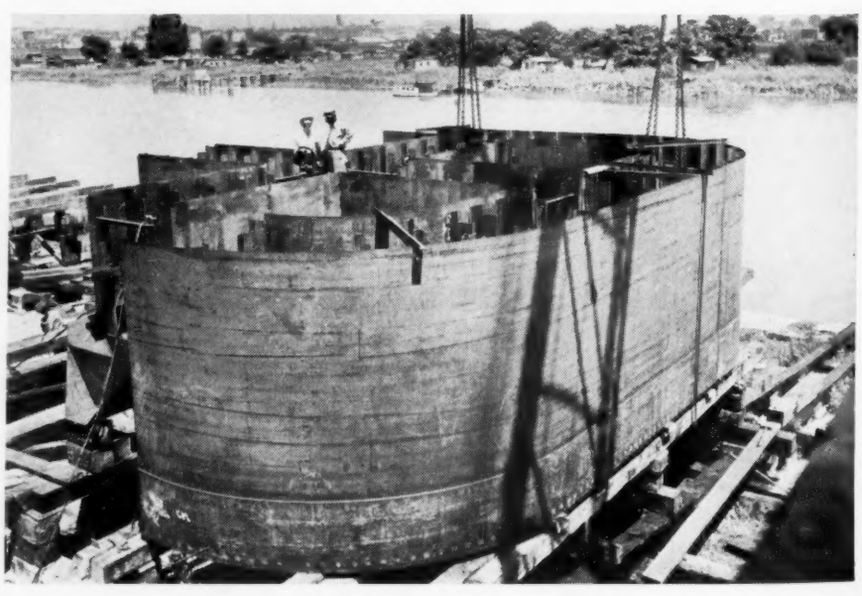
METALWORKING MACHINERY EXPORTS UP 133 PER CENT

American industrial machinery exported in February was valued at $25,631,261, or 58 per cent over February, 1937, according to the machinery division, department of commerce. Power-driven metalworking equipment was valued at $9,459,830, or 133 per cent over February a year ago. All types participated in this increase except gear-cutting and sheet and plate working machines. Other metalworking machinery totaled $353,865 in value, 15 per cent higher than a year ago.

Power generating machinery was exported to the value of $1,359,301, excluding electric and automotive, an increase of 24 per cent. Steam locomotives totaled $361,195, locomotive parts and accessories $149,823, and steam boilers $123,196.

Assembling All-Welded Steel Floating Caissons

■ To support the twin concrete piers of the Bronx-Whitestone bridge over East river in New York, two all-welded steel caissons were sunk recently on the Bronx side. When delivered the caissons were 38 feet square and 21 feet high. As they were sunk, by jetting through 8-inch pipes, additional lift sections, each 10 feet 6 inches high, were added, bringing the total structure to 110 feet 3 inches. At the 89-foot stage concrete was poured into the caissons, forming a sturdy concrete and steel foundation for the piers. The caissons were assembled by the Dravo Corp. at its Wilmington, Del., shipyards from sections fabricated in Pittsburgh, then towed to the bridge site.



LABOR

METALWORKING EMPLOYMENT IN 5TH MONTHLY DECLINE

■ EMPLOYMENT at leading metalworking centers declined during February for the fifth consecutive month to the lowest level since July, 1936, according to the National Metal Trades association, Chicago. The February index for 22 leading centers was 85.6 per cent of the 1925-1927 monthly average. This compares with 88.1 per cent in January and 88.5 per cent in February, 1937. With the exception of last year, however, February employment was the highest for that month since 1930. The high for last year was 105.2 in September.

COLORADO'S PLAN FAVORED OVER CIO'S

Employes of Colorado Fuel & Iron Co., Pueblo, Colo., voted 2426 to 198, in favor of the company's 24-year-old representation plan, despite CIO efforts to "organize" them. Total number voting—2624—represented 98 per cent of all employes.

BAR MILL RATES UNCHANGED

Bar mill wage rates for April, announced by S. C. Leonard, secretary, Western Bar Iron association, are unchanged from the March rates. Card rate on boiling, bar and 12-inch mills is $2.45; for guide and 10-inch mills, $2.55.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Mar. 26	Change	Same week 1937	Same week 1936
Pittsburgh ..	30	None	93	45.5
Chicago	31.5	+ 1.5	83.5	64
Eastern Pa...	29	None	58	38.5
Youngstown .	29	+ 2	85	74
Wheeling	41	+ 3	97	73
Cleveland	30.8	None	80.5	82
Buffalo	30	+ 2	90	47
Birmingham .	66	+ 5	80	69
New England.	18	+ 3	85	67
Cincinnati ...	45	+20	80	55
St. Louis	37	None	82	†
Detroit	27	— 5	100	94
Average ...	35	+ 3	90	58.5

†Not reported.

Research Medal Awarded By British Institute

■ First presentation of a newly established Institute of Metals medal was a feature of the thirtieth annual general meeting of the British Institute of Metals in London, March 8-10. Sir William H. Bragg, honorary member of the institute, president of the Royal society and director of the Royal Institution of Great Britain, was the recipient. He is well known, particularly for his investigations in X-ray examination of metals, also for work in other fields of scientific research.

Purpose of the medal is to recognize outstanding services to nonferrous metallurgy. Made of pure platinum, the medal was contributed by the Mond Nickel Co. Ltd., and will be awarded at intervals of a year or more without restriction to nationality or membership in the institute.

Dr. C. H. Desch, superintendent, metallurgical department, National Physical Laboratory, Teddington, England, was elevated to the presidency of the institute, succeeding W. R. Barclay, Mond Nickel Co. Ltd. Prof. J. H. Andrew, Sheffield university, Sheffield, was elected vice president and the following were named to the council: Dr. J. W. Donaldson, Scott's Shipbuilding & Engineering Co. Ltd., Greenock, Scotland; Engineer Vice Admiral Sir George Preece, engineer-in-chief of the fleet; and H. S. Tasker, managing director, Goodlas Wall & Lead Industries Ltd., London.

Announcements were made that the institute's £20,000 endowment fund is virtually complete and that the Institute of Metals and the Iron and Steel Institute will share offices and other accommodations at 4, Grosvenor Gardens, London, S. W. 1,, effective June 24.

Iron Meteorite Sets New Boundary in Argentina

■ A meteorite which fell countless ages ago has settled a boundary dispute in the Argentine after 400 years search. As far back as 1540 Spanish conquistadores noticed that spears used by Indians in Northern Argentina were tipped with iron. Legend attributed the source to a giant meteorite. The legend persisted, though the mass of iron could not be found.

In 1884 the Argentine congress decreed that the boundary between two provinces should pass through the location of the meteorite and a line was drawn through what seemed an approximate location. Discovery of the buried mass of metal has shown the original line was 13 miles distant and the boundary has been rectified. It has resulted in 1,500,000 acres being transferred from the province of Gran Chaco to Santiago del Estero.

PRODUCTION

■ STEELWORKS operations last week advanced 3 points to 35 per cent, seven out of 12 centers reporting increased activity.

Youngstown—Regained decline of the preceding week and was 2 points higher, at 29 per cent. Schedules for this week call for addition of another open hearth, with the rate probably 30 per cent.

Chicago — Increased 1.5 points to 31.5 per cent, highest this year. Some producers expect to enlarge production soon.

Birmingham, Ala.—Up 5 points to 66 per cent, with addition of another open hearth.

Pittsburgh—Adjustments by various producers balanced, continuing the rate at 30 per cent.

Wheeling—Gained 3 points to 41 per cent on more activity by one producer.

Cincinnati—Advanced 20 points to 45 per cent. This week the rate probably will be lower.

Buffalo — Addition of an open hearth increased operations 2 points to 30 per cent, the highest point in more than four months.

Central eastern seaboard — Unchanged at 29 per cent, although production is slightly easier.

New England — Lighting of an open hearth idle since December brought the rate last week to 18 per cent, a gain of 3 points. Schedules call for 20 per cent this week.

Detroit—Down 6 points to 27 per cent. One producer extinguished all open hearths Friday and may not resume steelmaking for three or four weeks.

St. Louis—For the third consecutive week operations held at 37 per cent.

Cleveland—Steady at 30.8 per cent with indications of the same rate this week.

Auto Production Down

■ Automobile production for the week ended March 26 totaled 56,800, or 755 less than in the preceding week, according to *Ward's Reports*. Comparisons:

	Week ended Mar. 26	Mar. 19
General Motors	23,160	23,860
Chrysler	12,225	12,975
Ford	12,060	12,560
All others	9,355	8,160

■ For the first time in the history of General Electric Co., the number of stockholders has passed the 200,000 mark. On Dec. 31 there were 201,219, an increase of more than 11,000 over a year ago, and 162,370 more than 10 years ago. Since 1917, or in the past 20 years, the number has increased more than 15 times.

MEN OF INDUSTRY

■ CHARLES D. LOVELAND has been appointed New York district sales manager, Truscon Steel Co., Youngstown, O., after ten years as district sales manager for the company at Newark, N. J. The New York district has been extended to include Newark, where B. G. Fair will be in charge as branch manager. John Fox continues as branch manager at New Haven, Conn.

Mr. Loveland began with Truscon at Columbus, O., shortly after graduation from Bucknell university in 1911. Before going to Newark in 1928, he was district sales manager in the Pittsburgh territory.

♦

W. F. Bender, formerly Pittsburgh representative for General Alloys Co., Boston, is no longer associated with the company.

♦

Harold S. Strouse, treasurer, Harnischfeger Corp., Milwaukee, has also assumed duties as a vice president.

♦

Gardner Henderson has been appointed district sales manager in the New England territory for the Youngstown Sheet & Tube Co., Youngstown, O. He formerly was Chicago district manager of A. M. Byers Co.

♦

Charles A. Heil, Cleveland manager for the Carpenter Steel Co., Reading, Pa., has been appointed president of Aetna Rubber Co., Cleveland. A director of the company since its organization, Mr. Heil succeeds Tracy J. Calhoun, resigned.

♦

R. V. Isham has been appointed manager of sales, wire division, Sheffield Steel Corp., Kansas City, Mo. He became associated with the company in July, 1928, supervising dealer sales. Later his work included supervision of jobber sales.

R. V. Isham

Charles D. Loveland

♦

Edward H. Patterson has been elected president, Fort Pitt Bridge Co., Pittsburgh, succeeding H. R. Bickle, who will continue as vice president of the company.

♦

Frank A. Hunter has resigned as vice president and general manager of sales, Hunter Saw & Machine Co., Pittsburgh, and will represent the company in the western territory.

♦

Dr. H. W. Gillett, chief technical advisor, Battelle Memorial institute, Columbus, O., has been chosen to deliver the 1939 Howe memorial lecture of the American Institute of Mining and Metallurgical Engineers.

♦

R. I. Ingalls Jr., vice president, Ingalls Iron Works Co., Birmingham, Ala., has also been elected president of the Steel Construction Co., a wholly owned subsidiary of Ingalls.

♦

Hugh N. Hurd has retired as assistant superintendent of the electrical department, Lackawanna plant, Bethlehem Steel Co. He had been employed by the company 31 years.

♦

A. H. Wobbe has been appointed assistant comptroller, American Car & Foundry Co., New York. He has been with the company since 1903 in various capacities in engineering, cost accounting, research and executive work.

♦

Earl E. Bates, formerly assistant general manager of sales, A. M. Castle & Co., Chicago, has been promoted to general manager of sales. Harry Christensen, heretofore manager of special products division, has become assistant general manager of sales, and Oscar F. Olsen has been made manager of railroad sales.

♦

Lindsay H. Crawford has been made resident manager of the Chicago office at 310 South Michigan avenue, recently opened by the Institute of Public Relations, New York.

♦

Arthur F. Milbrath, chief engineer, Wisconsin Motor Corp., Milwaukee, maker of gasoline and oil engines, has been elected a director and vice president. Harry M. Cronk, sales manager, also has been elected a vice president.

♦

Marvin F. Thoroughgood has been appointed southern California manager for the Columbia Axle Co., Cleveland, manufacturer of overdrive axles for Ford and Lincoln cars. The company's Los Angeles headquarters are at 3479 West Sixth street.

♦

Robert A. Trumpis, who has completed a three-year job of survey and standardization in the Jersey City, San Francisco and Chicago plants of Universal Form Clamp Co., Chicago, has been appointed general superintendent in charge of these plants.

♦

John S. Wright has been appointed sales representative in the Philadelphia metropolitan district for A. Milne & Co., iron and steel merchants, New York. He will have his headquarters in the Bourse building. His territory comprises southern New Jersey, Delaware, and the eastern section of Maryland, including Baltimore.

♦

L. A. Bassett, president, Hendrick Mfg. Co., Carbondale, Pa., celebrates this year his sixtieth anniversary with the company. When Mr. Bassett began work in 1878 as office boy, the company was making materials for the oil industry and was just beginning to perforate metals. Since

L. A. Bassett

then it has become an important manufacturer of all types of perforated metal screens and grilles, open steel flooring, and the like.

♦

K. L. Hansen, noted inventor in the welding field, and consulting engineer, Harnischfeger Corp., Milwaukee, has received the first honorary professional degree of electrical engineer ever to be granted by the college of electrical engineering, Milwaukee School of Engineering. Mr. Hansen is director of the welding institute established by the school several years ago.

♦

George S. Case Sr., since 1929 president, Lamson & Sessions Co., Cleveland, has been elected chairman of the board to fill the vacancy caused by the death of John G. Jennings. Roy H. Smith, heretofore vice president, has been elected

Earl A. Tanner

Formerly executive vice president, Milcor Steel Co., Milwaukee, who recently was elected president, as noted in STEEL, March 14, page 37. He succeeds Louis Kuehn, who has been made chairman of the board

president. The following officers have been re-elected: James F. Donahue, vice president and director of sales; I. L. Jennings, vice president and treasurer; H. H. Winterberg, secretary and assistant treasurer, and H. A. Keske, controller.

♦

B. C. Macgregor, formerly salesman with Bethlehem Steel Co.'s Cleveland office, has been transferred to St. Louis as district sales manager. Mr. Macgregor was associated with the Cleveland office since 1921, after working a brief period at the Homestead works, Carnegie-Illinois Steel Corp.

F. M. Huffman, formerly manager of sales at St. Louis, has been transferred to Baltimore as assistant manager of sales. J. W. Codding, salesman in the Boston district, has been promoted to assistant manager of sales at Boston, and G. A. Cushman, salesman in the Buffalo district, has been advanced to assistant manager of sales there.

E. H. Lipman

Who, as noted in STEEL, March 14, page 37, has been named secretary and treasurer, Milcor Steel Co., Milwaukee, succeeding A. J. Luedke, resigned

♦

Dr. C. H. Desch, superintendent of the metallurgical department, national physical laboratory, Teddington, England, has been awarded the Bessemer gold medal for 1938 by the British Iron and Steel institute. Presentation will be made at the annual general meeting of the institute May 4. Dr. Desch has long been distinguished as a teacher of metallurgical chemistry. He is a past president of the Faraday society and president-elect of the Institute of Metals.

♦

F. A. Westphal, superintendent of wire mills, Sheffield Steel Corp., Kansas City, Mo., has been elected president, Wire association, New York. Other officers are: Vice Presidents, John C. Callaghan, works manager, Canada works, Steel Co. of Canada Ltd., Hamilton, Ont., and E. W. Clark, mechanical engineer, wire and cable section, General Electric Co., Schenectady, N. Y.; secretary-treasurer, Richard E. Brown, publisher, *Wire & Wire Products*, New York.

DIED:

■ JOHN C. CAMPBELL, 78, president, Newark Wire Cloth Co., Newark, N. J., in that city, March 18. Mr. Campbell began his career in the wire cloth industry in Stephen's Mills, later known as the De Witt Wire Cloth Co., Belleville, N. J.

♦

Robert Vincent Rex, 61, for 31 years a superintendent for the H. C. Frick Coke Co., Pittsburgh, at his home in Lamberton, Pa., March 8. At the time of his death he was in charge of the Lambert, Buffington and Footedale mines.

♦

Arnold S. Durrant, 67, retired vice president, International General Electric Co., New York, in that city, March 21.

♦

Staats J. Cotsworth, 58, assistant manager of sales in the Philadelphia office of Carnegie-Illinois Steel Corp., at his home in St. Davids, Pa., March 19.

♦

Ian Douglas MacKenzie, 48, president, E. C. Fuller & Co., New York, and vice president, Smyth Mfg. Co., Hartford, Conn., bookbindery machinery companies, March 17.

♦

Dr. Erwin R. Stoekle, 47, vice president, Globe-Union Co. Inc., Milwaukee, manufacturer of radio apparatus, storage batteries, etc., in Boston, March 14.

♦

Frederick L. G. Straubel, 76, founder, Automatic File & Index Co., Green Bay, Wis., and pioneer inventor in the office equipment field, March 16.

♦

J. Frank Bennett, 59, treasurer and purchasing agent, Reynolds Wire Co., Dixon, Ill., in that city, March 19. Mr. Bennett was a director of the Illinois Manufacturers association.

♦

John A. Manning, 69, president, Behr-Manning Corp., Troy, N. Y., abrasive paper and cloth, and also president of Manning Paper Co., Albany, N. Y., at his home in Laudonville, a suburb of Albany, March 15.

♦

William L. Clouse, 79, chief engineer and director, National Machinery Co., Tiffin, O., in Biloxi, Miss., March 15. Mr. Clouse was well known for his inventions of forging machinery.

♦

Charles A. Swallow, superintendent, Richmond Malleable Iron Co., Richmond, Ind., and former superintendent of the Acme Steel & Malleable Iron Co., Buffalo, recently at his home in Richmond, Ind.

♦

Fred M. Ward, 57, secretary and assistant treasurer, Johnson Service Co., Milwaukee, and Johnson Temperature Regulation Co. of Canada, in Milwaukee, March 12. He joined the Johnson organization in 1910.

♦

Harry Warren Boulton, 42, industrial relations manager, Murray Corp., of America, Detroit, in that city, March 15. He had been with the Murray corporation since 1933, leaving Warner & Swasey Co., Cleveland, where he was a director of apprentice training.

MEETINGS

MANAGEMENT ASSOCIATION TO DISCUSS PRODUCTION

■ PRODUCTION division of the American Management association will hold its annual conference at the William Penn hotel, Pittsburgh, April 20-21. Two major themes are scheduled for discussion: "The Human Element in Production," and "Gearing Operations to Sudden Business Changes."

Specific topics under these heads are: "Getting Management's Viewpoint to Employes." "Methods of Sounding Out Employe Attitudes," "Foreman Training," "Developing Junior Executives," "Meeting Business Changes," "How Various Companies Prepare for Sudden Business Changes," "Wage Payment," and "Payment by the Year."

Earl M. Richards, assistant to vice president in charge of operations, Republic Steel Corp., Cleveland, is vice president of the production division.

MACHINE TOOL DEALERS TO HOLD MEETING IN DETROIT

Associated Machine Tool Dealers of America will conduct its spring meeting May 23-24 at the Dearborn Inn, Dearborn, Mich. Selection of a site near a large metropolitan center is an innovation, for association meetings usually have been held at resort hotels. Decision to meet in Detroit was based on a desire to reflect in the program outstanding examples in the application of machine tools typical of that city's large production plants.

Thomas A. Fernley Jr., 505 Arch street, Philadelphia, is executive secretary.

CONCRETE STEEL INSTITUTE TO MEET IN HOT SPRINGS

Concrete Reinforcing Steel institute is completing the program for its fourteenth annual meeting at the Homestead, Hot Springs, Va., April 28-29. Sessions are planned for the afternoon of April 28 and morning of April 29, with the annual golf tournament on the afternoon of the second day. Mark Beeman, 201 North Wells street, Chicago, is executive secretary.

MANAGEMENT CONGRESS, PUBLIC, TECHNICAL

Public and technical sessions are scheduled for the seventh International Management congress in Washington, Sept. 19-23. Public sessions will be devoted to addresses on broad management subjects; technical sessions will deal with problems related to personnel, labor and mechanical developments.

Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vt., and past president, American Society of Mechanical Engineers, will address one public session on "Balancing of Incentive and Security." Dr. Karl T. Compton, president, Massachusetts Institute of Technology, Cambridge, Mass., will speak on "Influence of Technical Progress Upon Social Development." At another public session, representatives from Germany, Italy and Czechoslovakia will argue for political and economic systems in their respective countries.

Among subjects for technical sessions are: "When Is a Machine Old?" "Organization for Control of Manufacture," "New Methods of Checking Results in Workshops," "Grading Labor Occupations," "A Survey of Personnel and Labor Developments in Great Britain, 1935-37," "Experience of the United States in Handling Labor Relations through Government Agencies," and "Dismissal Wages or Termination Allowance."

Convention Calendar

March 28-30—Society of Automotive Engineers. National passenger car meeting at Hotel Statler, Detroit. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary and general manager.

March 29—Export Managers Club of New York. Annual get-together at Hotel Pennsylvania, New York. O. O. Gallup, 2 Lafayette street, New York, is secretary.

April 1—Wire association. Regional meeting at William Penn hotel, Pittsburgh. Richard E. Brown, 17 East Forty-second street, New York, is secretary.

April 8-9—New England Foundry conference. Second annual meeting at Massachusetts Institute of Technology, Cambridge, Mass. R. F. Harrington, Hunt-Spiller Mfg. Corp., Boston, is committee chairman.

April 13-15—Midwest Power conference. Annual conference at LaSalle hotel, Chicago. Stanton E. Winston, Armour Institute of Technology, 3300 Federal street, Chicago, is secretary.

April 18-21—American Chemical Society. Semiannual meeting in Dallas, Tex. Dr. Charles L. Parsons, 728 Mills building, Washington, is secretary.

April 20-21—American Management association. Annual conference of production division at William Penn hotel, Pittsburgh. Alvin E. Dodd, 330 West Forty-second street, New York, is president.

April 20-22 — American Institute of Mining and Metallurgical Engineers. Twenty-first meeting of open-hearth committee and meeting of blast furnace and raw materials committee at Statler hotel, Buffalo. L. F. Reinartz, works manager, American Rolling Mill Co., Middletown, O., is chairman of open-hearth committee; Ralph H. Sweetser, Stuart, James & Cooke Inc., 17 Battery Place, New York, is chairman of blast furnace committee.

April 25-27—American Gear Manufacturers' association. Twenty-second annual meeting at General Brock hotel, Niagara Falls, Ont. J. C. McQuiston, 701 Shields building, Wilkinsburg, Pa., is manager-secretary.

April 25-27 — American Zinc institute. Twentieth annual meeting of institute and fourth meeting of galvanizers' committee at Hotel Statler, St. Louis. Ernest V. Gent, 60 East Forty-second street, New York, is secretary.

April 28-29—Concrete Reinforcing Steel institute. Fourteenth annual meeting at the Homestead, Hot Springs, Va. Mark Beeman, 201 North Wells street, Chicago, is executive secretary.

April 28-29—Association of Iron and Steel Engineers. Spring conference at Lord Baltimore hotel, Baltimore. Brent Wiley, 1010 Empire building, Pittsburgh, is managing director.

April 28-29—Society of Automotive Engineers. National tractor meeting at Schroeder hotel, Milwaukee. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary and general manager.

May 23-24—Associated Machine Tool Dealers of America. Spring meeting at Dearborn Inn, Dearborn, Mich. Thomas A. Fernley Jr., 505 Arch street, is executive secretary.

Tuna Clipper Is All-Steel, All-Welded

■ **First all-steel, all-welded tuna clipper built on the Pacific Coast is the SUN HARBOR, constructed recently by the Shockey Boiler Works, San Diego, Calif., for M. Crivello. Another is under construction**

February Exports Hold High Rate

■ EXPORTS of iron and steel in February continued at a high rate. While they were 11.3 per cent lower in quantity and 15.5 per cent less in value than in January, they were 46 per cent greater in volume and 28.5 per cent in value than in February, 1937, according to the metals and minerals division, department of commerce.

February exports, excluding scrap, totaled 203,850 gross tons, valued at $12,643,356, compared with 229,757 tons valued at $14,957,542 in January. In February, 1937, shipments were 139,714 tons valued at $9,734,132.

For two months this year exports total 433,607 tons valued at $27,601,898, surpassing the January-February figures in 1937 by 61.5 per cent in volume and 44 per cent in value.

Scrap exports in February totaled 256,790 tons, valued at $4,422,087, compared with 356,537 tons valued at $6,065,852 in January. In comparison with February, 1937, when they totaled 139,714 tons at a value at $9,834,132, the increase is 46 per cent in volume and 44 per cent in value. For two months this year scrap shipments totaled 613,327 tons, compared with 224,120 tons in the corresponding months of 1937, an increase of 173 per cent.

Pig iron led the entire list with 54,332 tons in February, compared with 35,997 tons in January and with 17,118 tons in February of last year. Japan took 27,107 tons, United Kingdom 21,673 tons, Canada 3603 tons and Union of South Africa 1949 tons.

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Feb. 1938	Jan. 1938	Jan. thru Feb. '38
Pig iron	54,332	35,997	90,329
Ferromanganese and spiegeleisen	55	2	57
Other ferroalloys	48	189	237
Ingots, blooms, etc.:			
Not containing alloy	28,983	37,551	66,534
Alloy incl. stainless	514	88	602
*Steel bars, cold finis'd	1,500	219	1,719
Bars, iron	63	349	412
Bars, concrete	1,206	1,761	2,967
Other steel bars:			
Not containing alloy	7,268	16,383	23,651
Stainless steel	137	9	146
Alloy, not stainless	382	545	927
*Welding rods, electric	160	72	232
Wire rods	783	2,488	3,271
Boiler plate	183	287	470
Other plates, not fab.:			
Not containing alloy	12,345	26,038	38,383
Stainless steel	12	10	22
Alloy, not stainless	186	288	474
Skelp, iron or steel	510	621	1,131
Sheets, galv. iron	413	176	589
Sheets, galv. steel	4,922	3,938	8,860
Sheets, "black" steel:			
Not containing alloy	19,488	16,570	36,058
Stainless steel	105	79	184
Alloy, not stainless	393	871	1,264
Sheets, black iron	441	649	1,090
Strip steel, cold rolled:			
Not containing alloy	2,883	2,232	5,115
Stainless steel	45	98	143
Alloy, not stainless	16	6	22
Strip steel, hot rolled:			
Not containing alloy	4,087	3,612	7,699
Stainless steel	1	6	7
Alloy, not stainless	4	9	13
Tin plate, taggers' tin	15,063	19,073	34,136
Terne plate	232	1,080	1,312
Tanks, except lined	2,389	5,083	7,472
Shapes, not fabricated	7,276	9,738	17,014
Shapes, fabricated	3,889	4,854	8,743
Plates, fabricated	613	830	1,443
Metal lath	71	75	146
Frames and sashes	202	65	267
Sheet piling	34	843	877
Rails, 60 lbs.	4,841	12,703	17,544
Rails, under 60 lbs.	1,656	4	1,660
Rails, relaying	544	467	1,011
Rail fastenings	654	922	1,576
Switches, frogs, etc.	183	217	400
Railroad spikes	232	178	410
R. R. bolts, nuts, etc.	57	106	163
Boiler tubes, seamless	430	410	840
Boiler tubes, welded	16	3	19
Pipe:			
Smls. cas'g & oil-line	5,267	4,484	9,751
Do. welded	3,997	1,067	5,064
Smls. black, ex. cs'g	411	393	804
Pipe fittings:			
Mall. iron screwed	216	208	424
Cast iron screwed	195	168	363
Pipe and fittings for:			
Cast iron pressure	1,127	568	1,695
Cast iron soil	671	847	1,518
Pipe, welded:			
Black steel	687	1,081	1,768
Black wrought iron	81	231	312
Galvanized steel	1,192	852	2,044
Galv. wrought iron	546	194	740
Pipe and fittings:			
Riveted iron or steel	3	840	843
Wire:			
Plain iron or steel	1,546	1,698	3,244
Galvanized	1,203	1,861	3,064
Barbed	901	823	1,724
Woven wire fencing	151	142	293
Woven wire screen cloth:			
Insect	11	15	26
Other	102	54	156
Wire rope, cable	218	305	523
Wire strand	98	88	186
Card clothing	2	1	3
Other wire	483	502	985
Wire nails	1,145	825	1,970
Horseshoe nails	144	114	258
Tacks	16	10	26
Other nails, staples	146	145	291
Bolts, machine screws	616	700	1,316
Castings:			
Gray iron, semisteel	276	260	536
Malleable iron	138	253	391
Steel, not alloy	78	67	145
Alloy, incl. stainless	48	29	77
Car wheels, tires, axles	1,315	2,561	3,876
Horseshoes and calks	1	2	3
Forgings, n. e. s.:			
Not containing alloy	931	516	1,447
Alloy, incl. stainless	41	59	100
Total (gross tons)	203,850	229,757	433,607
Scrap, iron and steel	255,627	355,781	611,408
Scrap, tin plate	840	514	1,354
Tin plate circles, strips, cobbles, etc.	274	96	370
Waste-waste tin plate	49	146	195
Total scrap (gr. tons)	256,790	356,537	613,327
GRAND TOTAL	460,640	586,294	1,046,934
Iron ore (gross tons)	174	115	289

*No distinction prior to 1938.

Farm Equipment Exports Make 46 Per Cent Gain

■ Exports of farm equipment in February were 46 per cent larger than a year ago, valued at $6,602,373, compared with $4,521,997, according to the machinery division, department of commerce. The largest increases were in tractors and harvesting machinery.

Wheel tractor exports were 93 per cent greater than in February last year, with a value of $2,675,886 compared with $1,387,620. Tracklaying tractors increased 20 per cent over a year ago with a total of $1,629,160 compared with $1,365,569.

Activities of Steel Users, Makers

■ MONARCH Steel Co., Indianapolis, producer of cold drawn steels and shafting, and three special steels manufactured under an exclusive process, has completed negotiations whereby Fitzsimons Co., Youngstown, O., which also makes cold drawn steels, will sell Monarch special steels as a licensee. The special grades include Speed Case X-1515, Speed Treat X-1535 and Speed Treat X-1545.

♦

Alloy Metal Wire Co., Prospect Park, Pa., producer of wire, rods, and strip in monel, nickel, stainless and electrical alloys, is installing new equipment and making plant arrangements to increase capacity.

♦

Tool Equipment Sales Co., Chicago, has been appointed exclusive agent in Chicago and surrounding territory for the commercial stamping department of Pines Winterfront Co., Chicago, maker of automatic radiator shutters.

♦

Koppers-Rheolaveur Co., a Koppers Co. affiliate, has been awarded a contract by the Franklin County Coal Corp. to construct a mechanical coal cleaning plant adjacent to the tipple at the corporation's Royalton Mine No. 7, Royalton, Ill. It is to be ready Aug. 1.

♦

Machinery and equipment of the replacement parts division, Warner Gear Corp., Muncie, Ind., are being moved to Auburn, Ind., where the company has purchased the plants and property of Auburn Automobile Corp. A new company has been organized to take over the replacement parts division.

♦

Simonds Mfg. Co., Pittsburgh, is celebrating the forty-sixth anniversary of its founding in Pittsburgh in 1892. The company supplies cut gears to specifications. Spur gears up to 150 inches in diameter and bevel or mitre gears up to 60-inch diameter are produced on modern automatic machinery. It has a complete pattern shop.

♦

Carbide & Chemical Corp., subsidiary of Union Carbide & Carbon Corp., New York, plans to erect a large plant on a 200-acre site near Texas City, Tex., to manufacture a number of chemical products, including industrial alcohols, ethers, ketones, plastics and solvents. No date has been set for starting the project. The company owns several other chemical plants, the largest being in South Charleston, W. Va., and Whiting, Ind.

Accuracy and Reliability IN MACHINE TOOLS

PROVIDE FOR ACCURACY, LONG LIFE, AND RELIABILITY IN YOUR PRODUCT AT LOW MANUFACTURING COST.

How about the price paid for inaccuracies in machining? Yes, what about those spoilage costs?

If it is a fact that such cases do occur, then it must be admitted that the condition is not conducive to the Lowest manufacturing costs possible of attainment.

Right off the bat then: Reliability to maintain Accuracy for an entire short run of work or for Long periods of volume production is an acknowledged credit to Bullard Mult-Au-Matic Performance.

And Mult-Au-Matic Performance is not talked of in terms of one year or two years, but in periods of MANY years.

Why? Well, because Accuracy and Reliability are designed and built into these Bullard Manufacturing Units. These are well-known facts.

That's why users of Mult-Au-Matics invariably specify these machines for replacement or expansion equipment.

Whatever your turning job may be, "It Can Be Done" at low cost the Mult-Au-Matic way.

Send samples, prints, or sketches, and let us submit facts and figures for your analysis and comparison.

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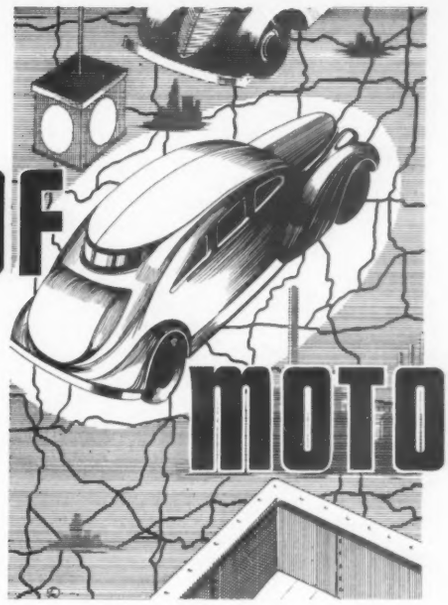
MIRRORS OF MOTORDOM



DETROIT

■ PRICE is coming to be the big talking point in motordom these days, both as far as current models are concerned and as far as plans for 1939 series enter the picture. In view of the fact incomes generally are shrinking, and employment has tapered sharply, car builders are faced with the choice of giving more car for the money or cutting prices. For a while it appeared likely trimming of retail prices would eventuate; now it seems more probable the trend will be toward giving more car for the money by adding extra trim and embellishments to exteriors and refinements to interior decorations as well.

Coincident with this trend is a move toward giving added push to so-called "standard" lines as against "deluxe" lines. Plymouth, for example, has rechristened its standard line the "Roadking" series and last week announced two additional sedan models — two-door and four-door trunk styles—in the series. The Roadking models have the same engine as the deluxe line, the same dimensions and numerous other identical features. Major differences are in tire size, gear ratio, carburetors, speedometers, electrical equipment, number of spring leaves, and, of course, price.

Five Roadking Body Styles

The expanded Roadking line now has five body styles, ranging in price from $645 for the coupe to $746 for the four-door touring sedan, delivered in Detroit. A number of new features in the way of trim and hardware have been incorporated into the series.

It will be recalled Ford recently likewise added a number of extra appointments to the standard series of models to enhance their value and improve appearance.

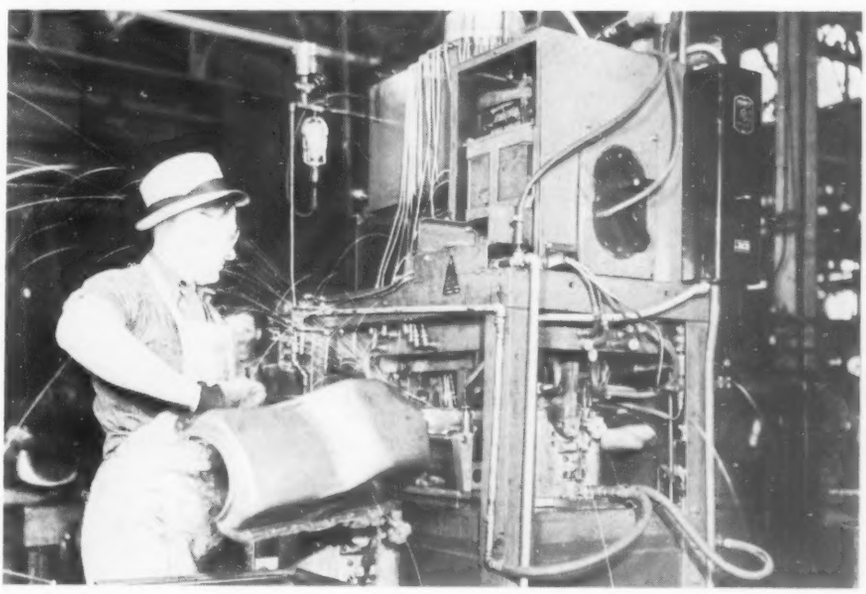
Meanwhile, at Toledo, O., the Willys organization has been moving ahead with new plans for maintaining its good showing in the extreme low-price field made last year. Personnel has been rejuvenated with the addition of W. C. Cowling and Delmar G. Roos to the sales and engineering departments, respectively; changes also have been made in personnel of the purchasing department.

The latest Willys bid for business has been the introduction of the five-passenger two-door sedan model, called the Willys Clipper, and referred to previously in these columns. Production of the Clipper model, priced at $549 delivered in Toledo before federal taxes, began several weeks ago, and details were supplied to dealers and distributors at general meetings throughout the country and a national sales gathering in Toledo. The price is claimed to be $95 below that of any American-built sedan model on the market.

■ DECISION to add to the exterior and interior appointment of car models, rather than to reduce retail prices, probably resulted from the

BY A. H. ALLEN
Detroit Editor, STEEL

Spot Welding De Soto Oil Pans



■ **In fabrication of De Soto oil pans, 38 spot welds are required, and they are made automatically in this Roth hydromatic welding machine. Separately controlled hydraulic cylinders operate the welding contactors in proper sequence after the pan and reinforcements are locked in the fixture of the machine**

fact that manufacturers are able to obtain these accessory items at considerably less cost than was possible last fall. Thus there is a little more margin between retail price and cost of materials than prevailed six months ago, so car builders are in a position to budget extra expense for embellishments. Furthermore, rumors of impending price reductions naturally may have had an unsettling effect on sales, so that if the public can be given to understand prices are not going to be adjusted, but that additions are going to be made to models, a stimulating effect on sales may result.

With further reference to the report here last week concerning proposals to drop 8-cylinder models in 1939 by certain producers in the low-price field, an additional commentary is the well-founded although unconfirmed report circulating through automotive channels that next month will see announcements of new lines of light 6-cylinder models priced about $100 below current 6-cylinder lines. Effect of such an important revision of the setup in the low-price field will be watched with interest, assuming the plan finally jells.

■ FIGURES on used car exchange week reveal increases ranging all the way from 35 to 200 per cent over sales the week previous. Ford dealers sold 57,894 used cars, grossed $14,327,589, reduced used car stocks by 22,804 units or $8,000,000. Interpolating this performance for the rest of the industry, it is apparent approximately 200,000 cars were moved during the campaign, still leaving an estimated 600,000 used cars in the field, not an abnormal supply.

Spring weather having arrived, a continuation of good used car sales logically could be expected, but in view of the low level of new car sales the spring upsurge normally experienced may fail to develop.

Car sales during April and May will be important indicators of what may be expected in motordom for the balance of the year. Production during these months likely will exceed sales, and if considerable improvement in retail demand is not experienced, it would not surprise many to see a general shutdown of possibly two-months duration this summer. The problem of realizing a profit on the present rate of restricted production is bordering on the acute stage. Already a good many releases to General Motors divisions in Flint and Lansing have been deferred from two to five weeks.

■ ACTIVITY in 1939 models in automotive plants is a study in contrasts, some companies being unusually busy, others practically dormant. For example, at one of the large independent plants here, a department devoted exclusively to new model layout and development, ordinarily employing a force of from 35 to 40, currently has only two men at work and they are doing nothing of importance. Apparently this interest is giving no thought to new model programs which would imply the virtual impossibility of having new cars ready for display by September. The obvious answer is that this company intends to go into the fall automobile shows with present models. Such a policy is almost unheard of, yet it seems the only reasonable deduction.

Packard engineers are reported experimenting with a new type of gear-shift control mounted on the steering column. Its introduction probably will be a matter of months.

Graham has been attempting to get underway again on production of cars, but so far its assembly line is idle. A conference with suppliers was held last week with the idea of persuading them to proceed on shipments of a certain quantity of parts for a specified number of cars, these shipments to be billed against a separate company. The latter would turn over small quantities of parts to Graham as they were needed and would reimburse suppliers as fast as Graham used the parts in production. This would avoid the extra freight costs involved in continual shipping of small quantities of parts to meet current needs.

Some suppliers were indisposed to agree to this suggestion, feeling that should Graham fail to release parts which they had already fabricated, they would be left in the cold on payment for the unused balance. Meanwhile production of Graham tractors is proceeding at a rate of 25 per day, with a two-month backlog of orders reported on hand.

Encouraging prospects for tractor buying are contained in figures assembled by *Ward's Automotive Reports*, this service noting that as of April 1 of last year, 19.9 per cent of all farms in this country owned tractors, and the number of tractors in use increased by 10 per cent from 1936 to 1937 to bring the total to 1,382,893. Farm equipment manufacturers believe two-thirds of the 6,300,000 farms in the country are prospects for tractors, a minimum of 4,200,000 units. Thus a market for 2,500,000 to 3,000,000 tractors is envisaged. It is at this market that manufacturers of the less expensive one-plow tractors are aiming.

The new Ford tractor is of the latter type; Allis-Chalmers and Deere & Co. also have units of this type. Since its sudden unveiling by Mr. Ford, not much has been heard of his new $375 tractor, and it is reported production plans are marking time until Mr. Ford's return from the South where he took one of the new tractors, presumably for test purposes.

Graham Tractor Higher Priced

The Graham tractor, retailed by Sears, Roebuck, is of the two-plow type, somewhat higher in price and in a field occupied by most all implement manufacturers. Avery Farm Equipment, Peoria, Ill., is planning to introduce new equipment of this type, according to *Ward's Reports*.

New model trivia: The streamline crease across the door and cowl of Chevrolet models will be out for next year, according to present information. It was planned to revise this design last year, but when instructions went out to slash die costs for 1938 models, the revision was abandoned.

"Entirely new designs" in automotive power plants are foreseen in the very near future by David E. Anderson, chief engineer, Bohn Aluminum & Brass Corp. He reasons that "most of the present engines are transitions which have been modified, refined and developed from year to year but which have not been fundamentally changed. As a result it has not always been possible to adapt new practice to these engines. The new units will not only develop more horsepower per cubic inch of piston displacement, but will also give better gasoline economy."

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	†1937	1938
Jan.	377,244	399,186	228,074
Feb.	300,810	383,900	*220,000
March	438,943	519,022	.....
April	527,625	553,231	.....
May	480,518	540,377	.....
June	469,368	521,153	.....
July	451,206	456,909	.....
Aug.	275,934	405,072	.....
Sept.	139,820	175,630	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

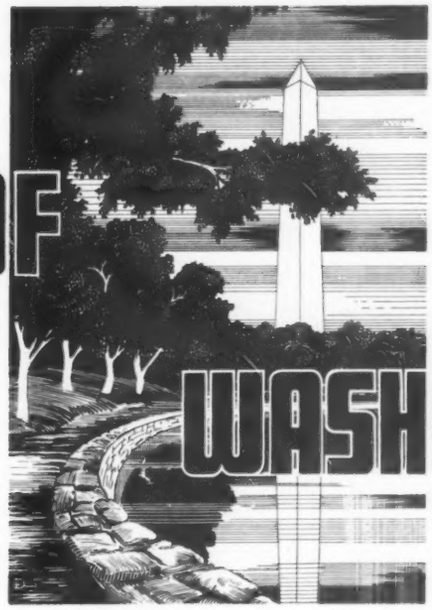
*Preliminary.

†1937 figures revised.

Week ended	
Feb. 19	59,100
Feb. 26	56,977
March 5	54,440
March 12	57,438
March 19	57,555

(Note—Due to delay in compilation, figures for week ended March 26 will be found on page 23.)

WINDOWS OF WASHINGTON



WASHINGTON

■ UNITED KINGDOM import duties advisory committee has restored, effective April 1, the former higher import duties on certain iron and steel products, the American embassy in London has informed the commerce department. Duties on some steel commodities were reduced materially last July 7.

Some speculation exists as to whether or not British authorities may be taking this opportunity to increase rates to the old level before opening negotiations on a trade agreement. This speculation is based on probability England may grant concessions on these products. However, it must be remembered when reductions were announced last summer no trade agreement was contemplated, and at that time March 31 was set as the date to restore former duties.

It may be recalled the United Kingdom treasury order, made July 2 and effective July 7, reduced the import duty on all quota shipments of iron and steel products (except iron products) from 10 per cent to 2½ per cent ad valorem.

At the same time import duties on excess-quota shipments of iron and steel products falling within the quota classifications, and on rough or machined castings, stampings, and pressings weighing 7 pounds or over (other than gutters, domestic tanks, or cisterns), and on rough or machined forgings were reduced to 12½ per cent ad valorem. Formerly products in this group were subject to various specific duties or to ad valorem rates ranging from 20 per cent to 33½ per cent.

Import duties on wire products were not affected.

Among iron and steel products on which import duties were reduced were ingots, blooms, billets, rails and other railway materials, angles and shapes, girders, beams, joists, and various types and classifications of bars, sheets, plates, rods, hoop, strip, and other items.

Shipments of iron and steel products within the quota classifications had to be accompanied by a certificate of origin in order to be cleared at the lower rate of duty. British importers were required to obtain quota certificates for the importation of steel products subject to the licensing system.

Steel exports to Great Britain have increased sharply during the past two years. In 1936 they totaled 15,962 tons, increasing last year to 373,961 tons.

BY L. M. LAMM

Washington Editor, STEEL

SENATE COMPLETES OPEN HEARINGS ON TAX BILL

Only a few days were spent on open hearings by the senate finance committee which is rewriting the tax bill recently passed by the house. Hearings were completed last week.

The house dealt a blow to the tax bill (from the administration viewpoint) by refusing to vote a penalty tax on the undivided income of closely held corporations, and the senate finance committee, led by Chairman Pat Harrison of Mississippi, obviously is preparing to strip the bill of what was left of the undistributed corporate profits tax.

Several business representatives appearing before the finance committee urged repeal of the undistributed profits levy and revision of the capital gains tax. The bill as it passed the house retained the principle of the profits levy for corporations having incomes in excess of $25,000 a year.

During the course of the finance committee's hearings many petitions were received from industry and business asking elimination of the undistributed profits tax principle, a return to flat-rate tax on capital gains, a reduction of the higher surtax rates and the broadening of the tax base.

Senate leaders, including Chairman Harrison and Majority Leader Barkley, predicted last week the tax bill would become law within 30 days.

Ellsworth C. Alvord and Roy C. Osgood appeared before the finance committee on behalf of the chamber of commerce of the United States.

Mr. Alvord said in part: "The prime objective of present revenue legislation should be to encourage business activity in the interests of economic welfare. If business activity can be brought to a satisfactory level, revenues will automatically take care of themselves.

"In order to stimulate business activity, the obstructive effects of certain taxes and certain excessive rates must be ameliorated, the tax structure simplified and inequities reduced."

PRESIDENT, LABOR LEADERS PUSH WAGES-HOURS BILL

House committee on labor still is wrestling with the wages and hours bill problem. Whisperings of difficulties and disagreements emanate occasionally and indicate the main differences among members are the minimum wage to be established and what agency is to administer the law.

President Roosevelt still is maintaining great interest in an hours and wages bill and has hopes one will be passed during the present session of congress. He held a conference recently at the White House attended by William Green, president, American Federation of Labor, John P. Frey of the metal trades department, and other officials of the federation.

It is reported Green is willing to accept minimum wages lower than

40 cents per hour if necessary—but he is anxious to get some kind of bill passed. Evidently he feels some kind of a start should be made now which can be perfected to his liking at later sessions. Under one of the bills on which the labor committee is working, 40 cents per hour and 40 hours per week would be included but several years would be allowed before making these limits mandatory.

BOTTOM OF RECESSION REACHED, SAYS ROPER

Secretary of Commerce Roper last week declared he saw evidence of resistance to further business and economic decline, "indicating the liquidation period has about subsided. While an immediate dynamic upturn is not to be expected, yet factors that now stimulate confidence, coupled with seasonal influences, should augment the rate of activity during the ensuing months."

Mr. Roper said "in many instances, inventories have reached the point of bare subsistence and must be replenished to meet accumulated consumer demand. Already accelerated production is being reflected in the automobile and textile industries as well as among industries that are affected by the rise that is gaining momentum in the housing field."

CANADIAN TRADE AGREEMENT HEARINGS TO START APRIL 4

Committee for reciprocity information last week completed hearing domestic interests in connection with the United Kingdom trade agreement. Following a summing-up by the committee, the information will be turned over to the state department which will try to work out a mutually satisfactory agreement.

The next work will deal with the proposed revised Canadian agreement. Time for filing briefs has passed and hearings will start April 4. It is not expected these will last long.

During the closing hours of the hearing on the United Kingdom trade agreement the American Federation of Labor sharply protested proposed reduction in aluminum tariff rates on behalf of its affiliated unions in the aluminum industry.

David Williams, president, National Council of Aluminum Workers unions, and Boris Shishkin, representing the AFL, said unemployment threatens the aluminum workers if tariff bars are lifted.

Pointing out the disastrous effect of the reciprocal trade agreement with Switzerland in 1935, reducing the tariff rate on the importation of aluminum foil which resulted in 6200 per cent increase in aluminum foil imports, they pleaded for maintenance of the existing tariff on aluminum and aluminum alloys of 7 cents a pound.

Representative Case of South Dakota last week made a plea to the committee for reciprocity information on behalf of domestic manganese producers.

The congressman reviewed the troubles of domestic producers and told of their fight for a protecting tariff. In addition to the wartime phases of producing manganese in the United States, he said, the country needs manganese "if you are going to make steel for ordinary domestic purposes."

Mr. Case had some colloquy on manganese duty in the trade agreement with Brazil with members of the committee who said the full duty reduction had been made on manganese imports and "there is no possibility under the law of reducing it further." Mr. Case replied: "Yes, I am aware that it isn't going to go below 50 per cent, because I introduced a resolution of inquiry to determine the fact, and the secretary of state replied to that very definitely stating that; but I was also told in communication with Mr. Sayre, in the department, that it might be that it would be included so as to be bound with the British agreement.

"The manganese producers of the country don't want manganese included in the further agreement, because we are hoping, if we can do what should be done for the domestic manganese industry, that the Brazilian agreement will be terminated and that it will not be bound in other agreements, where we would have to go through the process of terminating other agreements.

"If the chair will assure me that manganese will not be included, even at the present 50 per cent reduction, I will be glad to proceed to feldspar." The chairman said he could not give Mr. Case any assurance on this point.

ROPER CAUGHT BULL BY TAIL IN SMALL BUSINESS MEN

Secretary of Commerce Roper still is having his troubles with the small business men who now are planning to set up an advisory council similar to the present business advisory council.

While department of commerce officials naturally are not saying anything, they are not keen about having another council with whom they must meet periodically. However, both the secretary of commerce and the President told the small business men's conference here a few weeks ago that they would welcome an advisory council from their group. Probably this was said with tongue in cheek.

Secretary Roper told the elected chairmen of the conference he approved and welcomed such a council. He said "it must be a continuing body of men of such outstanding vision, of and in the interest of smaller business, that they will be accepted as representative of business for the entire country."

Mr. Roper has sent a final report on the analysis made by his department of nearly 4000 letters submitted to the President by small business men since the Washington conference Feb. 2 and 3.

Complaints and suggestions fall under the general classifications of business loans, local bank restrictions, unfair trade practices and legislative redress.

LEWIS ASKS $3,000,000,000 TO PROVIDE PWA JOBS

Congress is being urged by John L. Lewis, to appropriate $3,000,000,000 to provide jobs for 3,500,000 PWA workers for the coming fiscal year.

In a note to the house appropriations committee, Lewis asserts 13,000,000 in the United States are unemployed and calls this "a profound threat to our stability as a nation."

FTC PROBE OF AUTOMOBILE DISTRIBUTION URGED

The house last week passed a resolution directing the federal trade commission to investigate policies employed by manufacturers in distributing motor vehicles, accessories, and parts, and the policies of dealers in selling motor vehicles at retail and how these policies affect the public interest. The resolution still has to pass the senate before becoming law.

NEUTRALITY ACT REPEAL SOUGHT IN CONGRESS

Considerable pressure is being brought to bear on both the President and congress to repeal the neutrality act, to remove what are considered embarrassing restrictions and to permit a reversal of the administration's foreign policy.

Rumors are that both the President and Secretary of State Hull favor repeal, but, of course, they cannot openly admit this. As a result, it is reported some friends of the administration are going to take the responsibility on themselves to save the President and Secretary Hull from further embarrassment.

LABOR BOARD TO HOLD ELECTION AT LIMA, O.

The national labor relations board has announced an election will be held within 15 days at the Ohio Steel Foundry, Lima, O., to determine whether workers want to be represented by the International Molders Union of North America, Lodge 159, affiliated with the American Federation of Labor, for the purposes of collective bargaining.

Industry Groans Under Tax Impositions; Cost of Government Must Be Reduced

■ AT THIS time of year corporation heads issue their annual reports to stockholders. The reports for 1937 challenge attention. They recount the difficulties that beset managements last year because of existing tax policies.

Says H. E. Lewis, chairman, Jones & Laughlin Steel Corp.: "Tax burden of your corporation for 1937 increased alarmingly, being 58 per cent greater than the previous year. Total taxes, $6,233,043, were equivalent to a full year's dividend on the 7 per cent stock plus $3.68 on the common."

Says E. T. Weir, chairman, National Steel Corp.: "Taxes for 1937 represented $495.87 for each and every one of the 19,983 employes of the corporation as against $294.45 in 1936."

Republic Steel Corp., T. M. Girdler, chairman, and R. J. Wysor, president, reports: "Taxes which in recent years have been mounting at an alarming rate, were up 35 per cent . . . the heavy expense incident to preparation of the tax returns and completion of final audit and settlement are extremely burdensome and constitute a most serious situation to your corporation and to industry in general. In 1937 the corporation and its subsidiary companies filed approximately 3000 tax returns and 212,000 information returns."

Capital Expenditures Hampered By Undistributed Profits Levy

Says J. S. Sprott, president, Globe-Wernicke Co.: "Taxes which the company paid in 1934 amounted to $37,791.90. In 1937 they were $105,045.55. Every property owner must give more time and thought to the steadily increasing taxes which menace your welfare and our national prosperity."

Says F. B. Hufnagel, president, Crucible Steel Co. of America: "The federal undistributed profits tax seriously curtailed capital expenditures throughout the country. It prohibited your company from making planned modernizations and developments."

Says C. E. Tuttle, president, Rustless Iron & Steel Corp.: "Accumulation of such reserves is almost impossible for an expanding corporation under the undistributed profits tax provisions."

Youngstown Sheet & Tube Co., H. G. Dalton, chairman, and Frank Purnell, president, states: "Taxes accrued in 1935 were $1,788,000, in 1936 $2,933,000, in 1937 $6,019,000."

Reduction Must Be Followed By Balancing of Budget

The senate shows a more liberal attitude with respect to certain provisions of the new revenue bill, with indications it may eliminate altogether the undistributed profits tax and modify the capital gains tax. These changes alone should give impetus to the present slight improvement in business.

Desirable as these changes would be, it becomes apparent they will solve only part of the problem. The fact is taxes now are so high as to oppress business. Something must be done about this matter if prosperity is to be assured.

Fostered by the administration, the impression prevails widely that this is not a time to balance the budget. The logical answer is it must be balanced eventually, so the sooner the better. And it is essential that the balance be effected by lowering the cost of government rather than by creating new taxes.

This is a difficult task. It cannot be accomplished without the fullest encouragement to business, to the end that there will be less need for deficit spending by the government. The longer the task is postponed the more difficult it will be.

THE BUSINESS

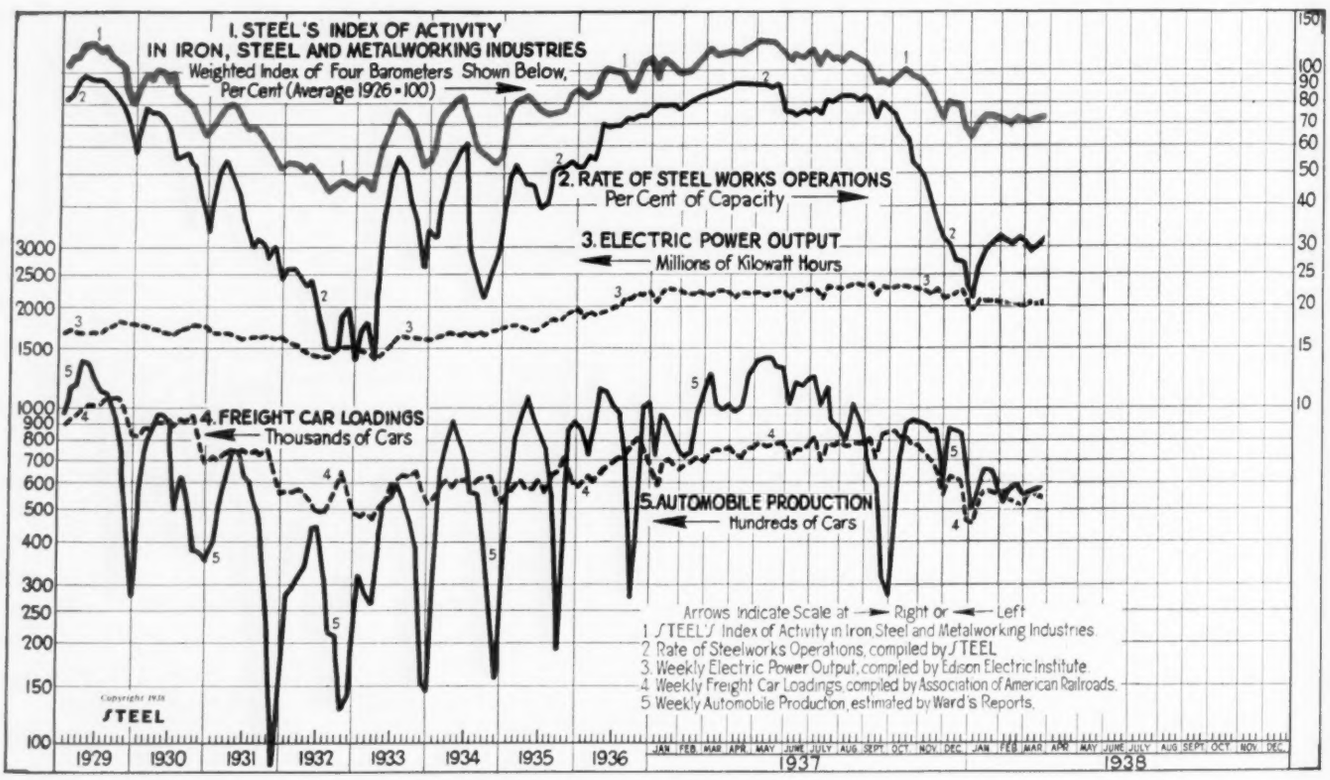
Activity Reacts Favorably To Seasonal Influences

■ NOW that seasonal influences are exerting a moderate effect on industrial activity in general, the prospects for an upward trend in the four important barometers composing STEEL's index of activity in the iron, steel and metalworking industries is somewhat brighter.

After fluctuating narrowly between 70.3 and 71.9 per cent throughout February, STEEL's index registered consecutive gains in the first two full weeks of March to reach 71.5 per cent in the week ended March 19, regaining almost all the ground lost in the closing weeks of February.

The rise in the index for the week ended March 19 resulted from a moderate increase in steelworks operations and electric power output, while auto production remained substantially unchanged, and revenue freight car loadings declined slightly.

Steelworks operations in the week ended March 19 came within one point of reaching the peak for this year


1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926-100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL
3 Weekly Electric Power Output, compiled by Edison Electric Institute
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
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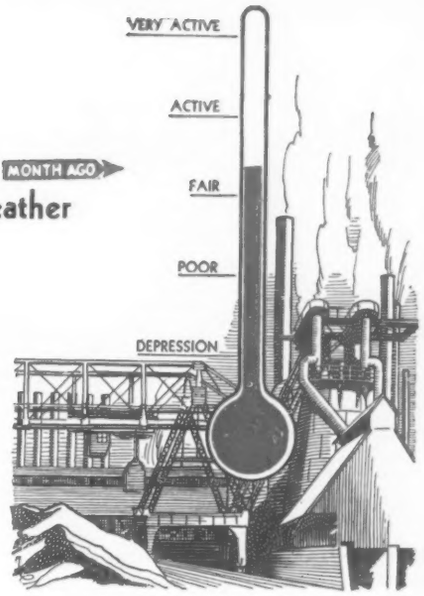
STEEL
1929 1930 1931 1932 1933 1934 1935 1936
1937
1938

STEEL'S index of activity gained 0.7 points to 71.5 in the week ending March 19:

Week ending	STEEL's Index of Activity Index No.		Steelworks Operating Rate Per Cent		Electric Power Output Million KWH		Freight Car Loadings		Weekly Auto Output	
	1937	1936	1937	1936	1937	1936	1937	1936	1937	1936
Dec. 18	79.4	114.8	27.0	79.5	2,202	2,274	603,292	729,696	82,025	121,038
Dec. 25	69.5	93.3	23.0	68.0	2,085	2,080	460,367	562,218	67,230	79,019
	1938	1937	1938	1937	1938	1937	1938	1937	1938	1937
Jan. 1	62.7	96.6	21.0	79.0	1,998	2,069	457,359	587,953	49,550	71,800
Jan. 8	70.1	107.8	26.0	79.5	2,139	2,244	552,314	698,529	54,084	96,780
Jan. 15	74.4	106.7	29.0	79.0	2,115	2,264	580,600	700,238	65,735	91,685
Jan. 22	74.7	104.0	30.5	80.0	2,108	2,256	570,333	670,376	65,418	81,395
Jan. 29	73.8	99.6	33.0	76.0	2,098	2,214	553,176	659,790	59,365	74,148
Feb. 5	70.9	100.8	31.0	79.5	2,082	2,201	564,740	675,026	51,443	72,295
Feb. 12	71.2	101.9	30.0	81.0	2,052	2,199	542,991	691,618	57,810	72,850
Feb. 19	71.9	108.8	31.0	83.0	2,059	2,211	535,790	714,884	59,100	95,698
Feb. 26	70.3	112.8	30.5	84.0	2,031	2,207	511,930	696,727	56,977	111,915
Mar. 5	70.1	117.9	29.5	86.0	2,035	2,199	552,916	734,127	54,440	126,975
Mar. 12	70.8†	112.7	30.0	87.0	2,014	2,212	556,664†	748,993	57,438	101,684
Mar. 19	71.5*	113.1	32.0	89.0	2,017	2,211	549,427*	759,269	57,555	99,013

*Preliminary. †Revised.

STREND



Industrial Weather

TREND:
Unchanged

of 33 per cent reported in the week ended Jan. 29. There are reasonable indications that during the next few weeks this important barometer will break into new high ground for this year. However, the present rate of 32 per cent compares unfavorably with 89.0 per cent a year ago, representing a decline of approximately 64 per cent.

Revenue freight car loadings so far this month while netting a substantial gain from the low point this year of 511,930 cars in the week ended Feb. 26, declined somewhat in the week ended March 19 to approximately 550,000 cars. Electric power output which has been fluctuating well under the 2,100,000,000 kilowatt-hour bracket since the week ended Jan. 22 rallied slightly in the week ended March 19 to 2,017,653,000 kilowatt-hours. At this time a year ago power output was above the 2,200,000,000 kilowatt-hour level.

Weekly auto production has yet to show any tangible increase resulting from that industry's efforts to relieve the used car situation. However, there are sound reasons for believing that production during the next few weeks should register a moderate seasonal increase, breaking through the 50,000 to 60,000 car-per-week range held with but two exceptions since the first of the year.

Activity, as measured by STEEL's index now is still substantially below 79.4 per cent established on Dec. 18, the last full week in 1937 before holiday interruptions occured. However, indications point to the likelihood that activity in the next few weeks will rise moderately and may regain fully the losses suffered since Jan. 22, when the index stood at 74.7 per cent.

Where Business Stands

Monthly Averages, 1937 = 100

	Feb., 1938	Jan., 1938	Feb., 1937
Steel Ingot Output	44.5	41.7	115.5
Pig Iron Output	46.4	46.1	107.1
Freight Movement	59.4	63.9	95.7
Building Construction	50.6	51.4	80.0
Automobile Production	52.6	54.3	91.8
Wholesale Prices	92.4	93.7	99.5

The Barometer of Business

Industrial Indicators

	Feb., 1938	Jan., 1938	Feb., 1937
Pig iron output (daily average, tons)	46,655	46,426	107,857
Machine tool index	112.3	129.6	207.7
Finished steel shipments	474,723	518,322	1,133,724
Ingot output (daily average, tons)	70,969	66,626	184,361
Dodge building awards in 37 states (sq. ft.)	18,903,000	19,200,000	29,942,100
Automobile output	*220,000	228,074	383,637
Coal output, tons	27,000,000	30,880,000	42,110,000
Business failures; number	1,071	1,320	721
Business failures; liabilities	$13,359,000	$9,711,000	$9,771,000
Cement production (bbls.)		4,534,000	5,837,000
Cotton consumption (bales)	428,000	435,000	666,000
Car loadings (weekly av.)	431,090	564,106	694,564

*Preliminary.

Financial Indicators

	Feb., 1938	Jan., 1938	Feb., 1937
25 Industrial stocks	$155.86	$157.00	$232.09
25 Rail stocks	$22.19	$23.02	$44.68
40 Bonds	$75.56	$71.44	$89.45
Bank clearings (000 omitted)		$21,798,000	$23,718,000
Commercial paper rate, New York (per cent)	1	1	¾
*Commercial loans (000 omitted)	$8,896,000	$9,038,000	$8,649,000
Federal Reserve ratio (per cent)	80.6	80.2	80.4
Railroad earnings	†$6,919,879	$25,971,525	$38,436,679
Stock sales, New York stock exchange	14,524,824	24,145,011	60,871,262
Bond sales, par value	$127,700,475	$166,080,100	$285,187,800

*Leading member banks Federal Reserve System.
†January, December and January, respectively.

Foreign Trade

	Feb., 1938	Jan., 1938	Feb., 1937
Exports		$289,437,000	$232,504,000
Imports		$170,763,000	$277,805,000
Gold exports		$5,067,000	
Gold imports		$7,183,000	$120,326,000

Commodity Prices

	Feb., 1938	Jan., 1938	Feb., 1937
STEEL'S composite average of 25 iron and steel prices	$38.90	$38.95	$36.74
U. S. Bureau of Labor's index	*79.7	80.9	85.9
Wheat, cash (bushel)	$1.11	$1.13	$1.52
Corn, cash (bushel)	$0.74	$0.76	$1.24

*Preliminary.

98-Inch Strip Mill

Tandem cold mill will deliver 12½-ton coils. Lubrication serves 12,000 points of friction. Among innovations are alternating current run-out table motors. Much construction is welded

This is Part II describing Republic Steel Corp.'s new continuous strip mill at Cleveland. Part I was published last week

■ IN PLATE FINISHING and hot mill shipping building, running parallel to hot runout table but moving in the opposite direction, is the 213-foot cold runout table. Between the two tables at their north end is the transfer table, 208 feet long and 38 feet wide, with three sets of chain drag transfers for conveying plates from one table to the other. Because the transfer table extends into two buildings, overhead roof and crane loads are carried across it by a huge truss, 30 feet high and 216 feet long.

Four upcut finishing lines are provided in the hot mill: One line for 5/16-inch plate, one for ½-inch plate and two for 3/16-inch sheets. Each line consists of a cross-cut type, 2-knife shear, a 2-high leveler, a double rotary side trimming shear with an auxiliary knife for automatically cutting scrap into small lengths, and side pilers. The ½-inch line has an additional upcut shear and piler and the 3/16-inch lines additional 4-high levelers. One of the 3/16-inch lines also is equipped with an uncoiler for cutting sheets from coils. On these lines material is cut to any length from 6 to 50 feet at speeds from 100 to 300 feet per minute.

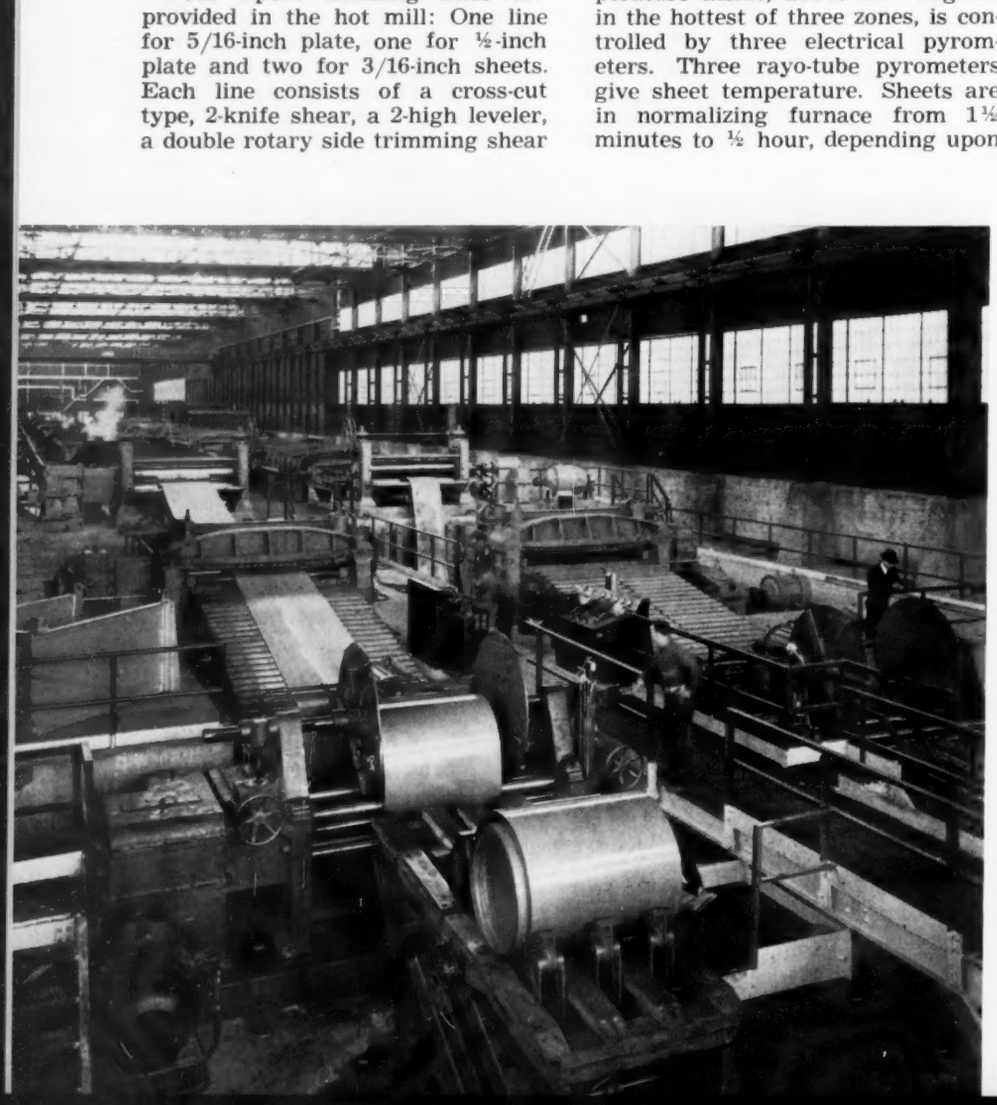
Continuous normalizing furnace in hot mill finishing department is 60 feet long and 9 feet wide. Temperature inside, about 1850 degrees in the hottest of three zones, is controlled by three electrical pyrometers. Three rayo-tube pyrometers give sheet temperature. Sheets are in normalizing furnace from 1½ minutes to ½ hour, depending upon the kind of heat treatment desired.

Batch pickler and scrubbing line for giving hot mill finished products a clean white surface is designed to handle sheets from 22 gage to ⅜-inch in thickness and from 60 to 168 inches in length. It consists of a pickling machine with three vats, an acid spray tank, water spray tank, scrubber and steam dryer. At the delivery end is a skin pass mill for black plate, a 4-high, 17-roll leveler and a hand piler.

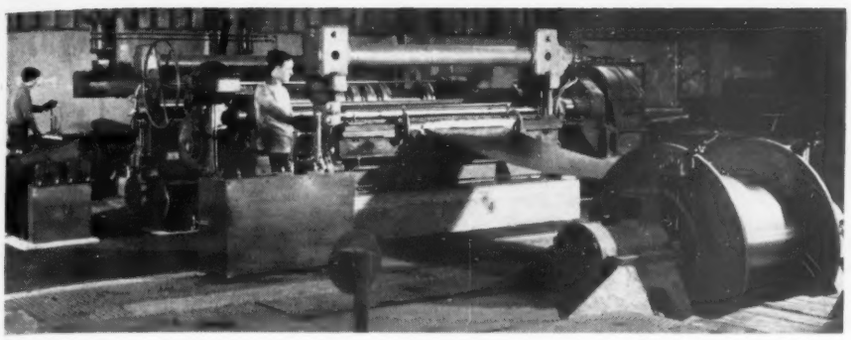
Two Parallel Lines

Pickling unit cleaning coils for further processing in the cold mill consists of two identical parallel lines, each 505 feet long. Space for an additional line has been provided. Each line consists of an uncoiler, a quick operating shear for squaring off strip ends, stitcher, looping pit, pinch rolls, four sulphuric acid tanks, a cold water tank, a hot water tank, dryer, additional pinch rolls, a shear for cutting out stitches, and recoiler. Speed of the lines is between 40 and 160 feet per minute. Temperature of pickling tanks, maintained at about 185 degrees Fahr., is controlled by 10 pyrometers, 5 in each line. Acid in pickling solution averages between 8 and 12 per cent.

Pinch rolls for moving strip are



Delivery end of two 505-foot continuous pickling lines containing four sulphuric acid tanks and two water rinses in each line. These remove scale and clean strip. Steel then is dried and sent by underground conveyor to cold mill



Coil slitting line in cold mill finishing department

12 inches in diameter and are driven by 25-horsepower, direct-current motors. In front of pinch rolls are adjustable side guides of vertical steel rollers. Looping pits of concrete, lined with wood, are 22 feet long. Acid tanks are welded steel plate, lined with ¼-inch rubber and faced with brick, bonded with a special sulphur compound.

Covers Rubber Lined

Covers on acid and hot water tanks are rubber-lined steel. An exhaust fan for each tank pulls acid fumes through a water spray scrubber and discharges them into open air through a rubber-lined stack. Each acid tank has a capacity of about 13,000 gallons and each water tank, 4000 gallons. Contents are changed by syphoning. In each acid tank is a dancer roll mechanism which is connected to the pinch roll speed rheostats automatically to keep the catenary between the support rolls at the proper point. Hot air blown on strip in the dryers to prevent water stains is under enough pressure to blow off water as well as to evaporate it. Recoiling units deliver a coil every 75 seconds.

Coils discharged from recoiling units are delivered by a pusher type conveyor, approximately 235 feet long, to a platform scale in the cold mill. Equipment here includes a 98-inch, 4-high, 3-stand tandem mill, two side trimming and flying shear lines, an upcut shear line, a single stand 98-inch combination sheet and strip mill, a single stand 98-inch skin pass mill, and a slitting line. Provision has been made, next to the 98-inch 3-stand tandem mill, to build a 60-inch 3-stand tandem mill of the same type.

The 3-stand continuous cold reduction mill rolls strip as thin as 24 gage. Maximum allowable variation in thickness of finished strip is 0.002-inch. Except for work rolls which are 20½ inches in diameter instead of 27 inches, stands of the 98-inch mill duplicate those in the hot mill. Cold mill rolls, heated by friction, are cooled by water circulated internally.

Each stand has single reduction gears and two forged steel mill pinions. Tension reel for recoiling strip is driven by a 600-horsepower, 250-875 revolution-per-minute, direct-current motor through gearing of 8.15 ratio.

This 98-inch, 3-stand tandem mill reduces cold strip to as thin as 24 gage. As steel comes out of mill, strip thickness is measured by micrometer indicating variations as small as 0.001-inch on large dial

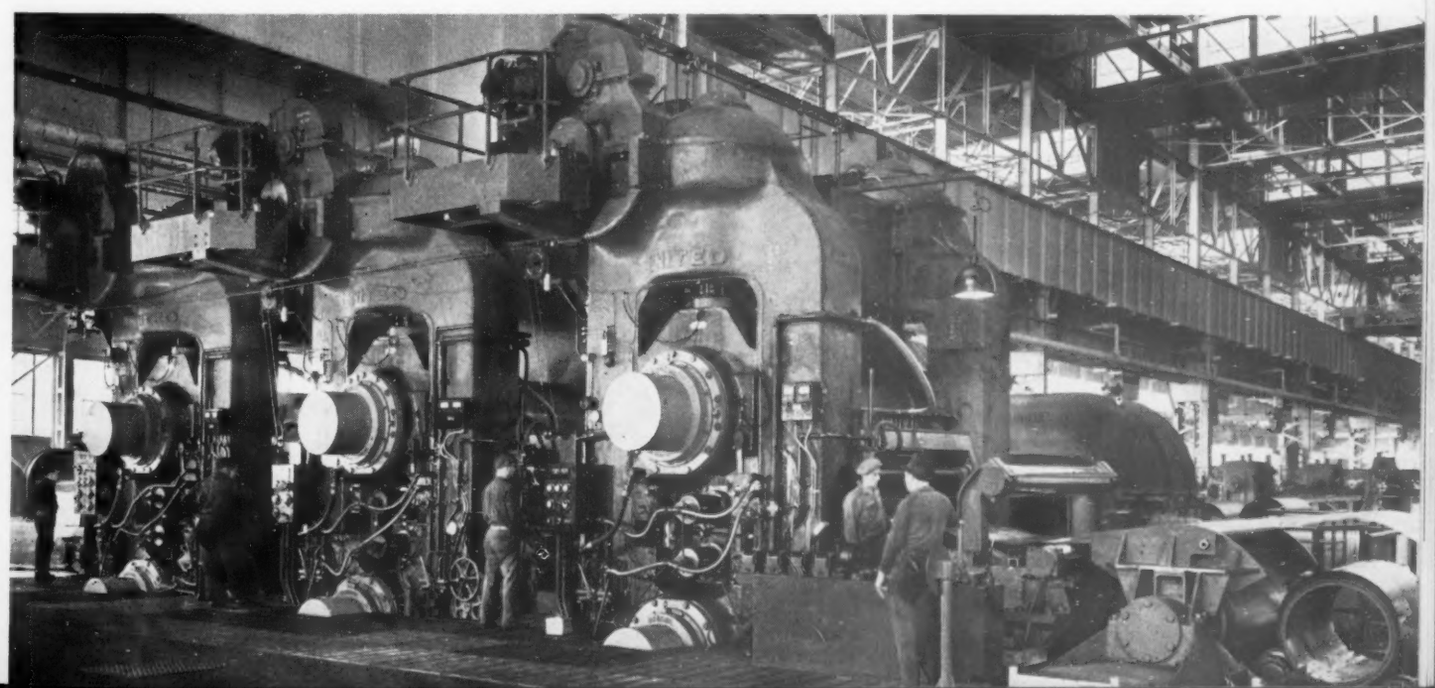
Three-stand tandem mill handles in one coil, welded together, two of the largest coils of strip rolled on the hot mill. Thus, when a welder is installed in the pickling line, where space has been allotted for it, this mill will be able to supply cold rolled coils weighing 12½ tons each.

All stands, both in hot and cold mills, have improved welded steel frame entry guides which move back as a unit when changing rolls, making them easily accessible and saving considerable time. Entry end of mill is equipped with a mechanical uncoiler and feeder which consists of a huge magnetic bender and motor-driven, air-actuated pinch rolls. This unit saves considerable time and enables one operator to open the stiff coils of strip.

Important Improvements

Uncoiler and recoiler units have a double air cylinder which makes it possible to prepare a coil for entry at same time another coil is still running out and a third is being removed at delivery end, saving about 5 minutes on each coil. This and the entry guide arrangement are two minor but important new improvements in the mill.

Two identical side trimming and flying shear lines each include: Uncoiler, pinch rolls, side trimmer with automatic rotary type scrap cutter, looping tables preceding and following a 15-roll leveler, flying shear, pinch rools and piler. Overall length of each line is 83 feet. Shears are designed to side trim and shear cold rolled strip up to 12 gage into 60 to 172-inch lengths at speeds from 150 to 400 feet per minute. Upcut shear line, 85 feet long, consists of uncoiler, 4-high 25-roll leveler, an upcut shear that can handle 30 to 98-inch strip,



as well as pinch rolls and an end piler.

Single stand 98-inch mill train for temper rolling and surface finishing either coils or sheets consists of tilting table, uncoiler, 4-high stand identical with those of 3-stand tandem mill, mill reel, leveler, oiling machine and piler. When used for coils, only uncoiler and reel are operated. Line is designed to handle sheets from 20 gage to 1/16-inch in thickness and up to 20 feet in length.

The 98-inch skin pass mill consists of tilting table, 4-high stand identical with those of 3-stand tandem mill, 4-high leveler, oiling machine and piler. It is driven by a 500-horsepower, direct-current motor and has a delivery speed of 167 to 334 feet per minute. Coil slitting line consists of uncoiler, pinch rolls and a slitting and trimming shear with scrap cutter same as that on flying shear line.

Coils and packs from the cold mill go to annealing furnaces on sled runners by special reversible conveyor, also used to return annealed steel to cold mill finishing department. In annealing building located between the pickling and cold mill buildings, there are five batteries of four box-type annealing furnaces, each 14 feet 4½-inches wide and 26 feet long inside brickwork. These are stationary or in-and-out type. Door opening of each chamber is 11½ feet wide and 10½ feet high above track.

Furnaces are fired with natural gas mixed with air or by-product coke-oven gas of from 500 to 1100 B.t.u.'s. Air for combustion is furnished by an individual 2000-cubic-foot-per-minute fan on each chamber. Estimated fuel consumption is 1,200,000 B.t.u.'s per gross ton annealed. Each chamber has firing ports at base of inside and outside walls supplied with fuel from four burners of the ribbon-flame type which produce a luminous flame throughout entire length of boxes. Waste gas flue is in chamber center below hearth level.

Annealing operation is precisely controlled. A pressure regulator controls gas pressure for each group of 10 furnaces and a recording and integrating flow meter measures total flow of gas to entire battery. Twenty safety shut-off valves, one at each chamber, automatically shut off flow of gas to each furnace should fan air supply fail.

Instruments Control Temperature

Temperature inside furnaces reaches a maximum of 1350 degrees Fahr. and is automatically controlled by 20 electrical pyrometers with 40 relays and proportioning motors to regulate fuel flow. These instruments, one in each furnace, also make a permanent, continuous record of furnace temperatures. Electrical pyrometers chart temperature of steel being annealed at six points in each load. Heat penetration is about 1 inch per hour.

Conditioned gas to prevent oxidation of steel in annealing furnaces is supplied by three gas cracking units each with a 15,000-cubic-foot-per-hour capacity. Natural gas is primary fuel. Deoxidizers produce about 7 cubic feet of deoxidized gas for each foot of natural gas. Two 5-ton refrigerators deliver dry fuel at 60 degrees Fahr. Gas-tight construction of furnace bases makes good deoxidation a certainty.

Furnaces are served by an electrically-driven charging car of 200-ton capacity. Mounted on 2-wheel trucks, charging car moves on tracks 550 feet long. Annealing room equipment includes 107 welded steel annealing box covers, 10 feet wide, 8 feet 8 inches high and 12 to 24 feet long. Fifty-five cooling and loading docks are located opposite annealing furnaces.

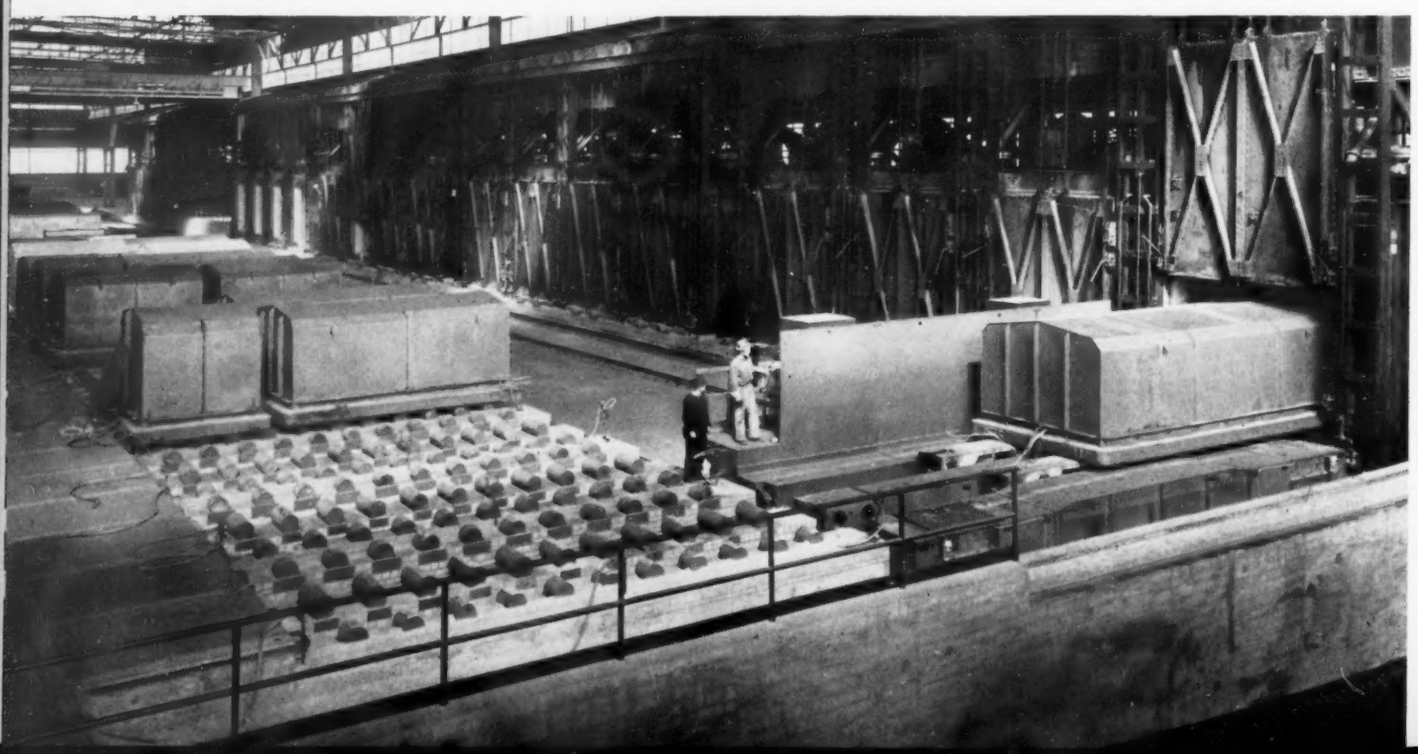
Maintaining extreme gage accuracy and highly finished surfaces is largely due to improved bearings, improved methods of lubrication and improvements on hydraulic de-scaling water spray system.

Work rolls are equipped with 4-row tapered roller bearings and back-up rolls with oil film, sealed sleeve type, tapered neck bearings. Back-up rolls ride in a non-compressible film of heavy lubricating oil at all times. Bearings are mounted on cast steel chocks equipped for roll balance with eight hydraulically-operated cylinders, four for work rolls and four for back-up rolls.

Main-drive reduction gears, plus drive gears for the three vertical edger stands and slab reducer are provided with roller bearings. Reduction gears in cold mill and pinions in both hot and cold mills also run on roller bearings instead of babbitt bearings.

Motors and generators in main motor room are equipped with ring-oiled bearings and reservoirs of ample capacity. Leakage of oil or entrance of dirt is practically impossible. Not only on mill stands but throughout the plant such as on table rolls, conveyors, reel drives, screwdowns, pinch rolls, trimmers and shear drives, roller bearings are used rather than brass or babbitt bearings.

Oil lubrication in hot mill includes an individual oil circulating system for reduction gears, a second system



Load of strip steel coming out of one of 20 annealing furnaces. Cooling docks are at left. Annealing cycle requires several days as heat penetrates steel at about one inch per hour. Conveyor in foreground carries coils underground from pickling lines to cold mill

for pinions, and a third for back-up roll bearings. In cold mill a circulating oil system for pinions and gears and another for back-up roll bearings are used. Oil in reduction gear and pinion systems has extreme pressure characteristics to prolong life and increase load carrying ability of gears and bearings. Circulating system serving back-up roll bearings contains highly refined lubricating oil.

Each system has a circulating capacity of 350 gallons per minute and has specially designed equipment for elimination of dirt and water. A total of 73,000 gallons of lubricating oil is in circulation in these five systems at any one time. There are 20 other oil lubricating systems with a combined capacity of about 8000 gallons. These serve individual units such as screwdowns, turntables, flying shears, slitters and other small gear drives.

More than 12,000 bearings and other points of friction must be greased. Plant includes seven greasing systems, five in hot mill and two in cold mill. These shoot grease from seven centralized greasing stations through a maze of small-diameter pipes that climb into 4000 different bearings, 3000 on hot mill and 1000 on cold mill.

One hot mill and one cold mill station work automatically every 30 minutes. In other stations, pressing a button forces grease into system. Indicators and alarms insure positive lubrication at all times. Equipment for heating and straining grease maintains a supply of fresh lubricant.

In addition to the seven central greasing systems, a number of small portable grease pumps are used on 5000 points in hot mill and 3000 places in cold mill. More than 50,000 pounds of grease and 100,000 gallons of lubricating oil were used in starting up the mill. Only a few drums of grease and lubricating oil per month, however, will be needed to keep mill in operation.

Processing oil, to protect sheet surfaces, is piped directly from a main storage tank to a number of metered stations in cold mill. Storage tanks for lubricating and processing oils have a capacity of 36,000 gallons.

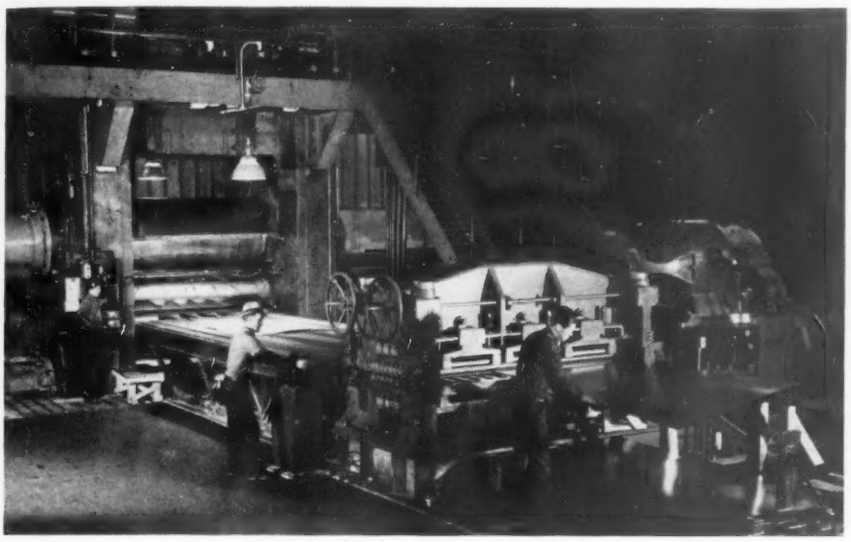
Water supply normally required for cooling machinery, for hydraulic sprays, rinse tanks, etc., is 30,000,000 gallons per day. Water is pumped from the Cuyahoga river by three 15,000,000-gallon centrifugal pumps equipped with automatic priming system and control. Entire mill supply is strained by two self-cleaning strainers with 1/16-inch perforations. A 350,000-gallon, all-welded standpipe, 125 feet high, supplements this water supply.

Scale on slabs in hot mill is forced off at three roughing stands and at two scalebreakers by a spray of water under a pressure of 1200 pounds per square inch, created by three 1200-gallon-per-minute, multistage centrifugal pumps driven by 1250-horsepower induction motors. Water also is stored in a 13,000-gallon tank in hot mill. To dampen pulsations in discharge systems and to absorb demand peaks, there is a hydro-pneumatic accumulator, a heavy all-welded steel tank.

Maximum steam requirements are 100,000 pounds per hour. Steam comes from the power plant at Republic's nearby blast furnaces and from blooming mill boiler house at Corrigan McKinney plant through 2 miles of welded pipe above ground supported on roller chairs setting on concrete piers. It is said to be the largest single electrically-welded steam line. It has an initial pressure of 170 pounds and a calculated flow of 95,000 pounds per hour, with a drop of about 50 pounds.

All electrical equipment throughout the plant can be locked out on switchboards so that a repair man can go safely about his work in and around machinery. Approaches to all cranes are stairways equipped with hand rails, no ladders being used. All moving parts such as motors, couplings, shafts, and screwdown drives are enclosed. Floors are brick in hot mill and pickling buildings and wood block in the cold mill. Floor openings are covered with anti-skid steel plate.

The welfare building, a two-story structure 46 x 216 feet, provides dressing and shower accommodations and an individual locker for every man.



The 98-inch skin-pass mill showing roller-leveler for straightening sheets

Power Locally Supplied

Total electric power demand of entire mill is 20,000 kilovolt amperes. Three-phase electric power supplied by local utility is brought to strip mill motor rooms by underground duct operated at 11,000 volts, 60 cycles. Secondary voltages of 2300, 600, 440 and 250 volts, some alternating and some direct current, are required.

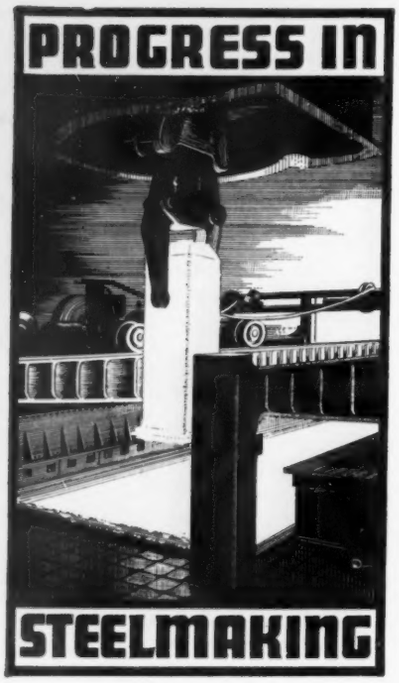
Hot mill finishing stands and cold reduction mill stands obtain power at 600 volts direct current from four 6000-kilowatt motor-generator sets. Roughing mill main drive motors, general service water pumps, spray pumps and air compressors receive power at 2300 volts from a 12,000-kilowatt-ampere transformer bank. The 250-volt direct-current supply is obtained from three 1500-kilowatt generators. For lighting and auxiliary motors a 3000-kilovolt-ampere transformer bank reduces voltage from 11,000 to 440.

To save on length and cost of interconnections between these transformers, switch gear and motors, transformers use non-inflammable non-explosive pyranol which permits placing them in motor room.

Hot mill requires almost 40,000 horsepower for main drive motors alone. Roughing mill main drive motors, three of which are provided with a heavy flywheel and automatically controlled to smooth out peak loads, are 3000 horsepower wound-rotor induction motors controlled by slip regulator. Main drive motors of first five finishing stands are 4500-horsepower, shunt wound, direct-current motors using Ward-Leonard control. Last finishing stand is driven by a 3500-horsepower motor of the same type.

When steel is in all six finishing

(*Please turn to Page* 55)



Flat Stock Units

For high-speed, continuous production of flat stock, the side trimming, slitting and processing operations have made necessary new and time-saving equipment

■ TO MEET the demand for high speed side trimming, slitting and processing equipment to accompany high speed, continuous production of flat stock, Yoder Co., Cleveland, has developed a new line of equipment. Time lost in removing and replacing coils is greatly reduced as two or more drums are provided; these are swung into line as required so that processing machines are kept in constant operation, yet ample opportunity is afforded for loading and unloading drums.

A drum is swung into or out of position by the operator who releases a locking device by stepping on a foot lever. A hand lever releases a brake to permit the drum to revolve freely on its supporting base. This uncoiling unit is shown in the foreground of the accompanying illustration.

All drums in this multiple uncoiling unit have adjustable drag brakes which allow the drums to pay off at the proper slitting tension and which prevent overruns when the processing train is stopped suddenly. Efficient brakes are necessary in pull slitting and when high speeds are used with heavy coils of material.

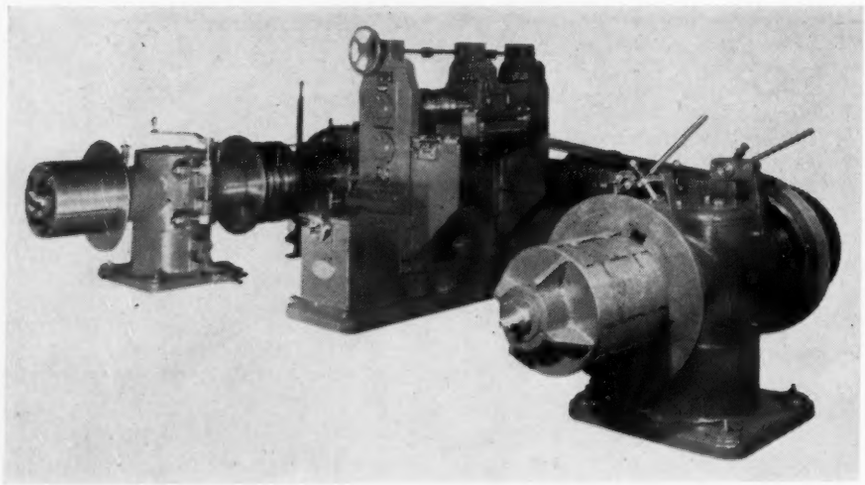
Slitting and edge trimming machine is shown between the uncoiling and recoiling units. It is equipped with a special attachment which guides the material into the slitter and simultaneously cleans the material and places a drag upon the stock as it is being slit. This is especially desirable where pull slitting is employed.

This machine readily lends itself to many modifications. For instance, when it is set up for side trimming, housing mounted cutters may be used and by a simple screw adjustment the width of the trimmed stock may be varied as required. Top and bottom cutters are moved without changing their relative positions. When frequent changes from edge trimming to multiple slitting are required, special adjustable cutters can be provided. The adjustments just described require about one minute to complete. Adjustments to change width of slitted strip require several minutes for changing each set of cutters moved.

Tension reel shown in back of the slitter is also a 2-drum type similar to the uncoiler. The separate drive mechanism is coupled to the coiling drum unit by operating a hand lever. The other drum swung out from the slitter line is easily accessible for the helper to wire the coils and remove them from the collapsed drum.

Multiple drum uncoilers and tension reels are not limited to slitting lineups but can be used in other finishing department lines as well. When it is desired to produce coils with different size cores for jobbing trade, tension reel drums of different diameter may be mounted on the same stand and each driven by the same power unit.

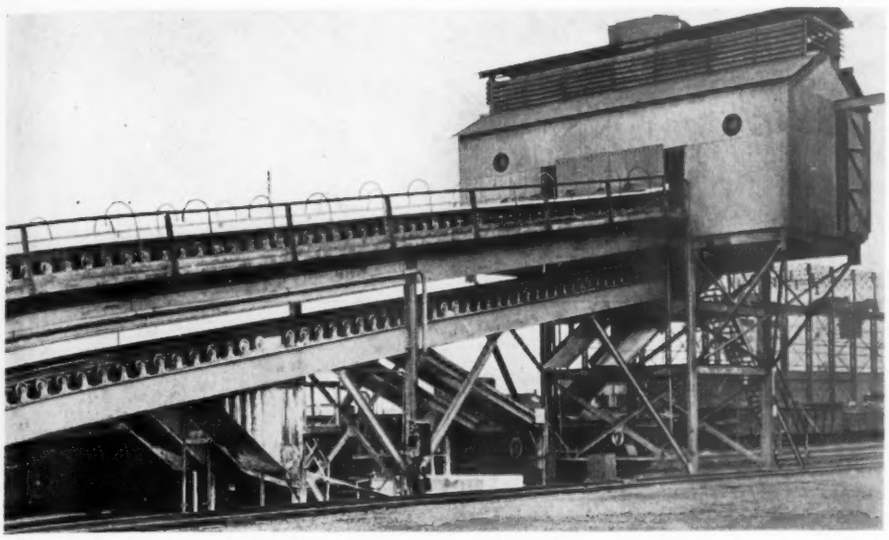
Slitting line features multiple drums on coiling and uncoiling units to facilitate placing and removal of coils and to permit more continuous operation of slitter



Half of Refractories Go to Iron and Steel

■ Approximately 50 per cent of refractories sales in the United States in 1935, based on dollar value, went to the iron and steel industry, it is revealed in technical bulletin No. 66 just issued by the American Refractories institute, Oliver building, Pittsburgh. Titled "Uses, Trends and Developments of Refractories in the United States," the bulletin presents information compiled by

THE STATIONARY WHEEL



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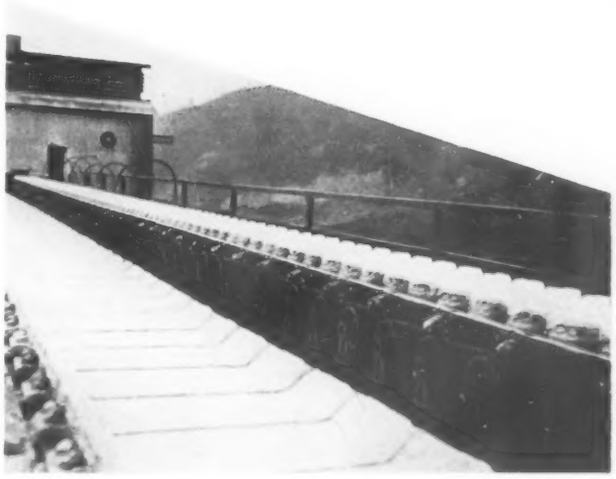
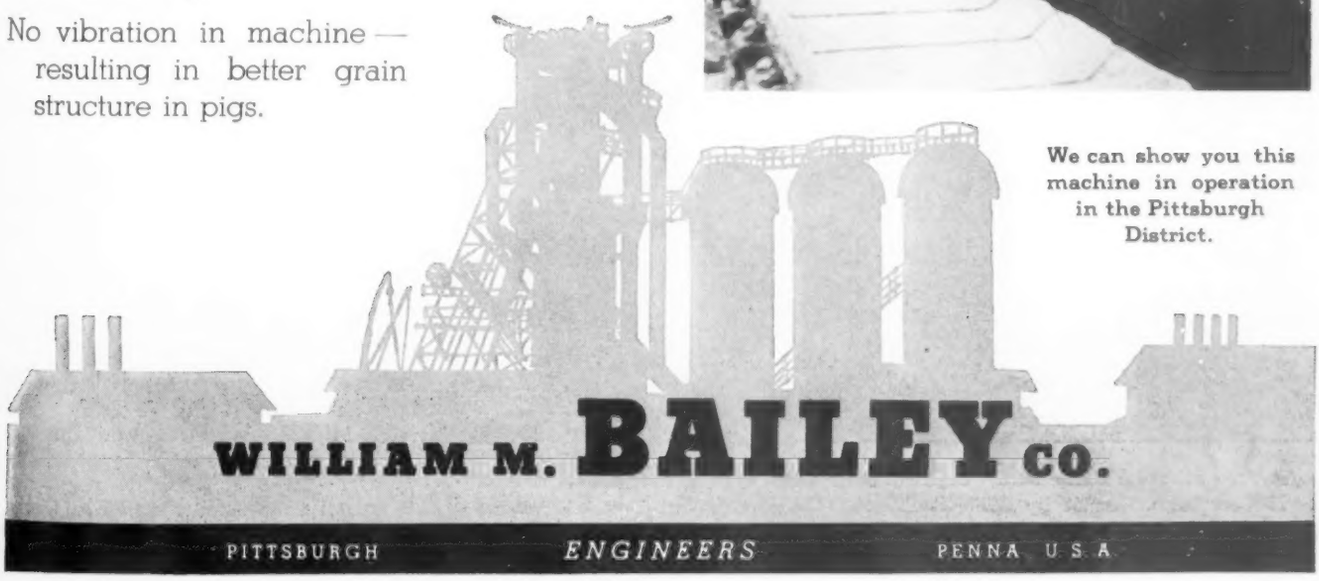


We can show you this machine in operation in the Pittsburgh District.



WILLIAM M. BAILEY CO.

PITTSBURGH *ENGINEERS* PENNA U.S.A.

John D. Sullivan, Battelle Memorial institute, Columbus, O.

The nonferrous metals industry accounts for 6 per cent of total sales; public utilities, 20 per cent; cement and lime, 5 per cent; glass, 5 per cent; oil refining, 4 per cent; ceramics, 3 per cent; miscellaneous, 7 per cent. The author points out that a current survey probably would show an increase in the percentage going into the iron and steel industry, and a decrease in public utility consumption.

Open Hearth Costs

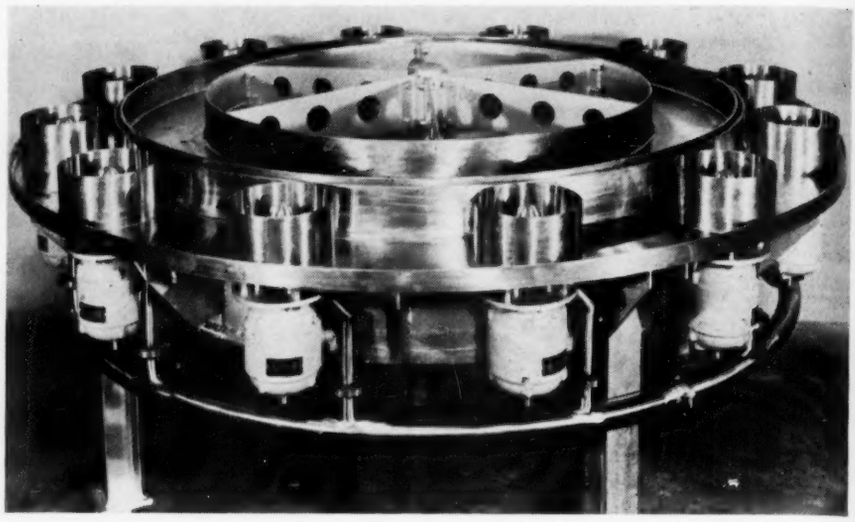
Total cost of refractories in one large open-hearth steel plant is stated to be about $0.90 to $1 per ton of steel produced. On a percentage basis, this cost is classified as follows: Ladle brick, 9; fireclay, silica cement, loam, slag pocket sands, etc., 5; chrome ore, 7; magnesite and dolomite, 33; sleeves, nozzles, stoppers, runners, plugs, etc., 6; basic brick, 12; silica brick, 23; and fireclay brick, 5 per cent.

The bulletin includes a chart which tabulates the uses of the most important refractory brick, ramming mixes, and the like, used in principal parts of many foundry furnaces. Discussed in the text are refractory testing and specifications, and trends and developments.

More Alloys Used In Cast-Iron Pipe

■ Manufacturers of cast iron pipe are turning more and more to the use of small additions of alloying elements, and are recommending alloy cast irons instead of carbon steel where resistance to oxidation at ordinary temperatures is important, according to Electro Metallurgical Co., 30 East Forty-second street, New York. Low chromium and chromium-nickel cast irons first were tried out with encouraging results but recently a 0.35 chromium, 0.35 copper type has been receiving favorable attention. The weldability and physical properties of this cast iron are excellent.

There's Alloy in Your Lemonade



■ **With many alloy steels, including the high-chromium stainless variety, it is now common practice to add sulphur for better machinability and to follow this with a zirconium alloy addition to prevent hot shortness and to improve hot rolling properties. This stainless steel, lemon juice extractor has motor shafts of high-chromium steel made machinable by such treatment. Photo courtesy Electro Metallurgical Co., 30 East Forty-second street, New York**

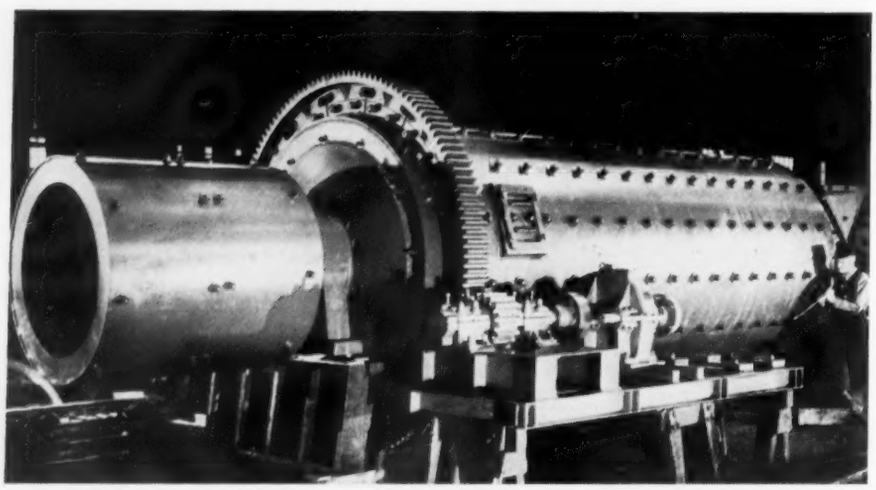
Strive to Reduce Milk Can Corrosion

■ Practical recommendations which should lead to eradicating discoloration and corrosion in canned cream are embodied in the recent technical publications series A, Nos. 49 and 72 of International Tin Research and Development council.

The work was undertaken by C. J. Jackson and G. R. Howat, Hannah Dairy Research Institute in conjunction with T. P. Hoar, International Tin Research and Development council.

Defects studied in this work are the occurrence of purpling, bronzing and pitting of the can, black particles in the cream and an explanation of the causes. Practical implications of this and a previous paper on the same subject relate to the quality of milk used for cream manufacture, quality of the tinplate used for cans, kind and amount of stabilizer used and the conditions of processing and storage.

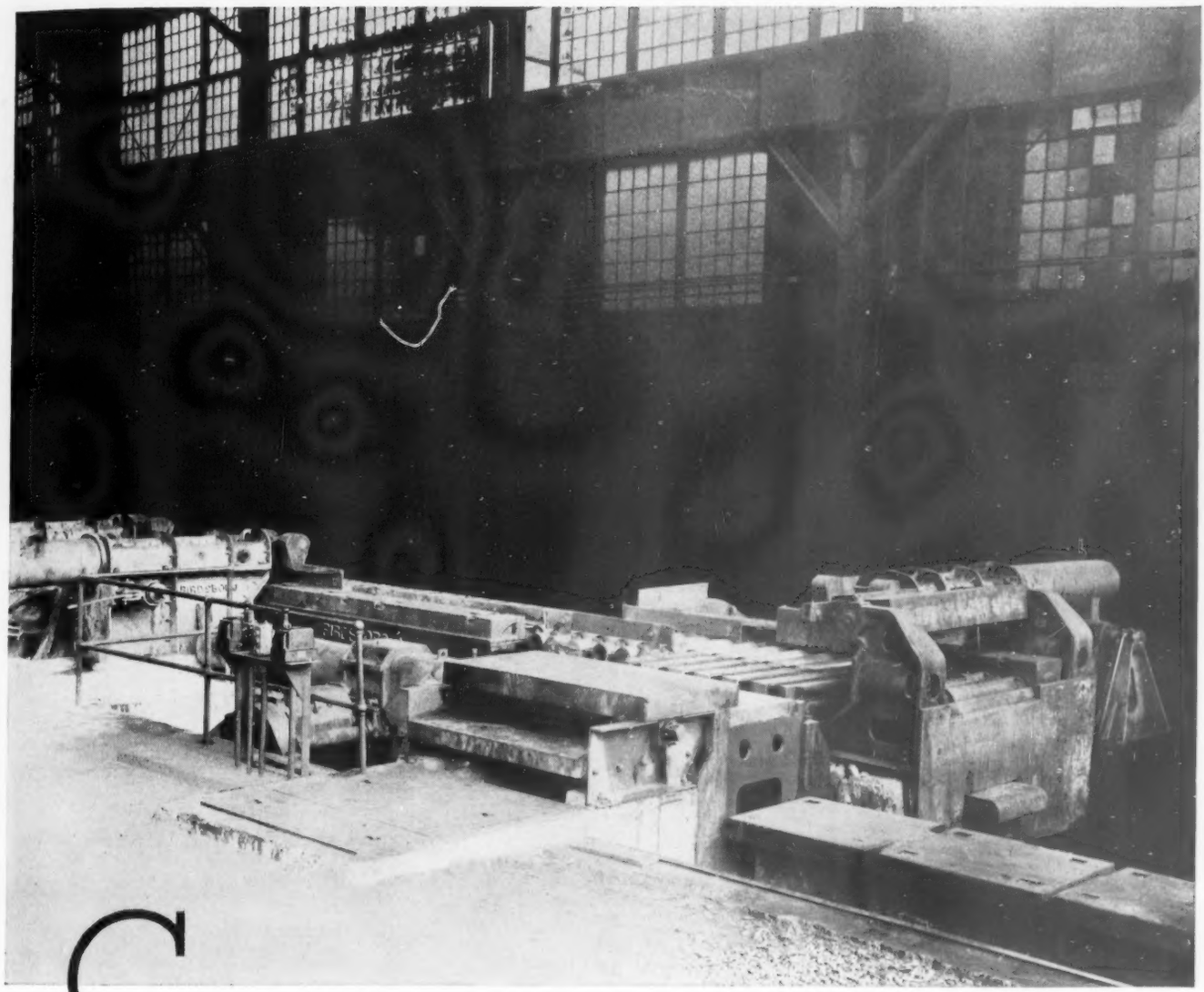
Over 33 Tons of Steel



■ **This all steel blade mill weighs over 33 tons, is 7 feet in diameter and 18 feet long. Built by Allis-Chalmers Mfg. Co., Milwaukee, it washes tenacious clay from crushed limestone used as blast furnace flux. Through the gears shown, it is driven by a 75-horsepower motor**

Aids Merchandising

■ As part of a 5-point dealer-aid program, American Rolling Mill Co., Middletown, O., is publishing a monthly merchandising paper for dealers in agricultural equipment. The paper is known as "The Farm Equipment Merchandiser," and was first published in February.



CUT DOWN HANDLING COSTS

Red hot billets and slabs travel from the Blooming Mill on this special Birdsboro-built run-out table.

Four mechanical pushers dispose of the material. Two pushers eject billets into cradles. The third pushes slabs onto the mechanical piling table; the fourth moves the piled slabs to the storage table where they are picked up by a crane without delaying the mill operation.

This is only one of many types of mill equipment designed by Birdsboro engineers to reduce handling costs. Consult Birdsboro about the development of equipment to meet your needs.

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High Production

New plant for making Speed nuts includes heat-treating department, a wide variety of progressive die stamping and forming operations and novel die making schedule

■ HIGH-SPEED production features a new stamping and forming plant just completed by Tinnerman Stove & Range Co., Cleveland. It is devoted to the manufacture of Speed nuts. This product (see STEEL of Feb. 5, 1934) was developed by the company as a means of fastening stove parts. Applications subsequently were developed in the assembly of many other metal products, with the result that the Tinnerman company sold 125,000,000 Speed nuts in 1937. The new plant has been designed to meet this growing demand.

Speed nuts may be made to fit a wide variety of uses and more than 250 different types have been produced on a production scale to date. Fig. 1 shows the steps involved in the manufacture of such a nut in one of its less complicated forms. As shown, this product is simply a piece of metal strip with a hole in it and with the metal slit on each side. The prongs thus produced are formed to fit the thread of a screw. Speed nuts are usually slightly arched lengthwise to give added spring action. This product supplants both nut and lockwasher.

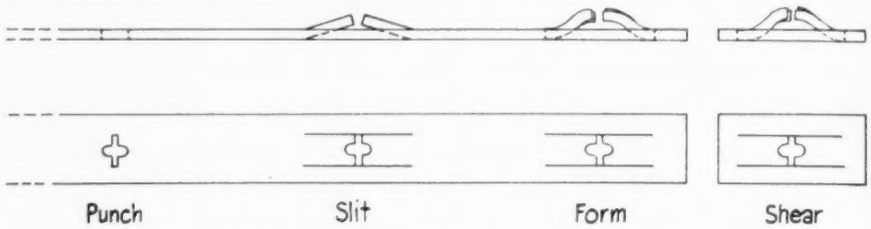

Fig. 1—Showing steps in making simple type of Speed nut

Four metals are used to meet various service requirements: Cold rolled steel for speed nuts used with sheet-metal screws; spring steel, 0.70 to 0.80 per cent carbon, heat treated, for use with machine screws; phosphor bronze and stainless steel where corrosion is a factor. Thickness of material varies from 0.010 to 0.050-inch; width of strip is from less than ¼-inch to nearly 4 inches.

The simple type nut shown in Fig. 1 is produced on inclined punch presses using progressive dies involving four stations to punch, slit, form and shear in the order given. As the stationary die totally encloses the strip, little variation in strip width is permitted, tolerances being plus 0.0025 and minus 0.0025-inch. Setup takes strip from coils, through a multiple roll straightener, through a reciprocating slide feed mechanism and into the progressive dies where successive punch, slit, form and shear produce a complete piece at each stroke of the press.

In forming from cold rolled steel,

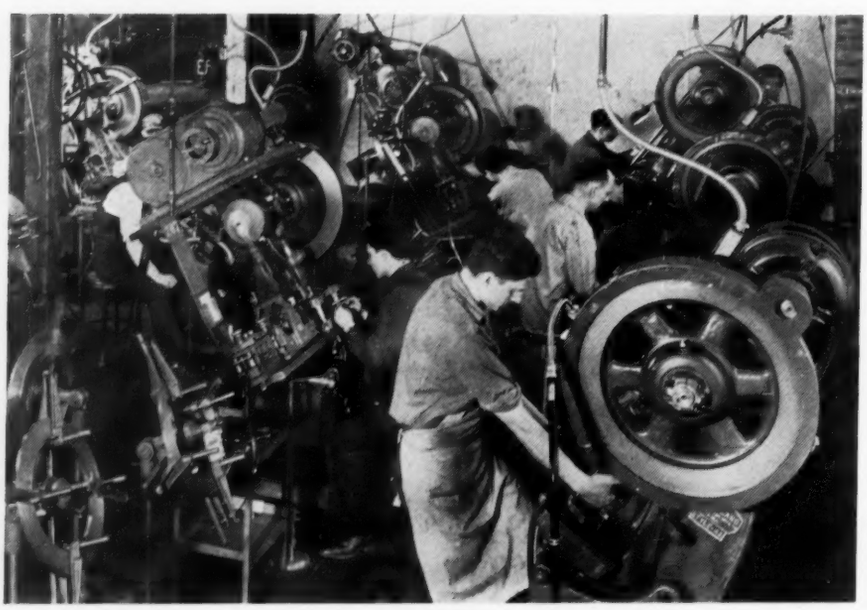

Fig. 2—Section of plant with six inclined presses handling punching and forming operations in progressive dies

phosphor bronze and stainless steel, with a certain amount of cold working is desirable, the sequence of operations is changed somewhat; the material is slit and raised first before it is punched. The raised portion between the slits thus receives a certain amount of drawing, highly desirable as a means of increasing hardness in this area.

Six presses vary in size from the small one shown in Fig. 5, which produces 14,000 pieces per hour, to those in Fig. 2. One of these is capable of handling strip up to 4 inches in width. Presses are individually motor driven and most of them include a variable speed transmission so that speed of operation can be closely adjusted to give maximum possible production for the type and size of Speed nut being handled. Output on the larger presses is not as high as on the small one, maximum speeds running near 12,000 pieces per hour. These machines operate so fast that an air blast is used to blow completed speed nuts away from the shearing station to prevent clogging at this point.

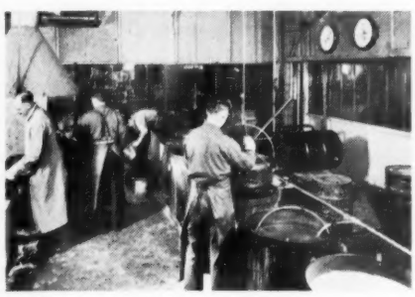

Fig. 3—Heat treating department with row of quench, clean and rinse tanks in foreground; salt bath and drying table at extreme left

Although production of the nuts shown in Fig. 1 involves only four progressive operations, other types are made necessitating up to 10 successive operations made in similar progressive dies. These dies operate at slower speeds so that their production rate is lower. Speed nuts with complicated forms are made in 4-slide machines, shown in Fig. 4, which apply force from four directions and which are capable of wrapping up a complete circle in one operation. The more complicated 4-slide machines deliver 3000 to 4000 hits per hour while simpler designs run as high as 8000 per hour. These also use strip material in a wide range of widths and thicknesses. Their flexibility makes it possible to produce special types of speed nuts which act as door latches, blind nuts for insertion through slots in the face of one of the sheets being fastened together, self-centering and locating nuts for fastening to subassemblies where screws go into concealed nuts and many other complicated forms. Variable-speed transmissions also are essential parts of these machines.

Heat treating nuts made from 0.70 to 0.80 per cent carbon spring steel involves a hardening and drawing procedure which exactly fits them for the use for which they are designed. For instance, speed nuts to be used with aluminum screws or alloys of similar characteristics are purposely drawn at a slightly higher temperature than usual to soften the nuts slightly so as to prevent them from cutting threads or body of the comparatively soft screws.

On the other hand, nuts used with molded products, where the nut is slipped onto a molded stud, are given a low temperature draw to maintain the hardness of the corners and edges so they will dig into the plastic with a firm grip.

Quenched in Oil

Heat treating starts in a salt bath where the nuts are heated to the critical temperature, around 1450 degrees Fahr. Then the nuts are quenched in oil, cleaned and rinsed in several solutions and thoroughly dried. After this, they are heated to 720 to 750 degrees Fahr., depending upon service conditions, in a drawing furnace with forced air circulation. They finally are water quenched, rinsed and dipped in hot soluble oil to give a finish resistant to corrosion.

Hardness produced is checked at frequent intervals on a specially built Rockwell tester as the usual machine will not give true readings when used on thin stock. Completed nuts are held between 45 and 51 on the Rockwell C scale, the exact figure depending upon the particular application involved.

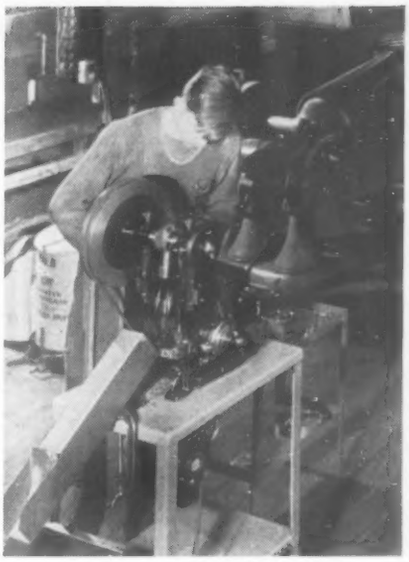

Fig. 5—Small high-speed press makes 14,000 nuts per hour. Tote boxes and tumbling barrel in background

Fig. 3 shows a line of cleaning and rinsing baths in the heat-treating department with the salt bath and drying table at extreme left. Two instruments shown at the upper right are used to control the furnaces accurately and to help produce uniform results. Special timers also are used to provide the exact period of hardening or drawing. Work is handled in large open mesh containers with hand hoists and overhead monorail facilitating movement in and out of the baths.

Nuts made from cold-rolled stock, phosphor bronze and stainless steel are not heat treated but, since the raw material is ordered, received and worked with an oil finish, these parts are cleaned to remove oil before packing for shipment. A vapor type degreaser handles this work rapidly and gives a clean product.

All raw material comes into the plant in the form of coiled strip

(*Please turn to Page* 66)

Fig. 4—Four-slide machines handle more complicated punching and forming operations. They can roll up a complete circle in one operation

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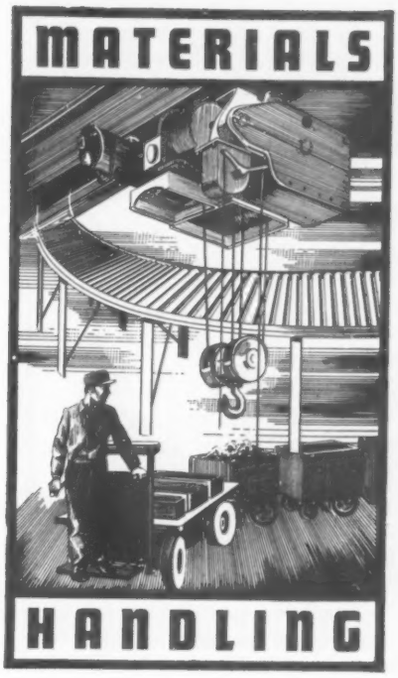


Straightline Stamping

Continuous overhead conveyor and system for handling scrap facilitate the flow of production in new building used by a producer of automobile bodies and parts

J. A. CRONIN, Materials Handling Editor

■ HEINTZ Mfg. Co. recently found that it had outgrown its existing facilities. This became apparent when the company diversified its lines and began to develop a substantial business in stamped metal parts for a wide variety of products.

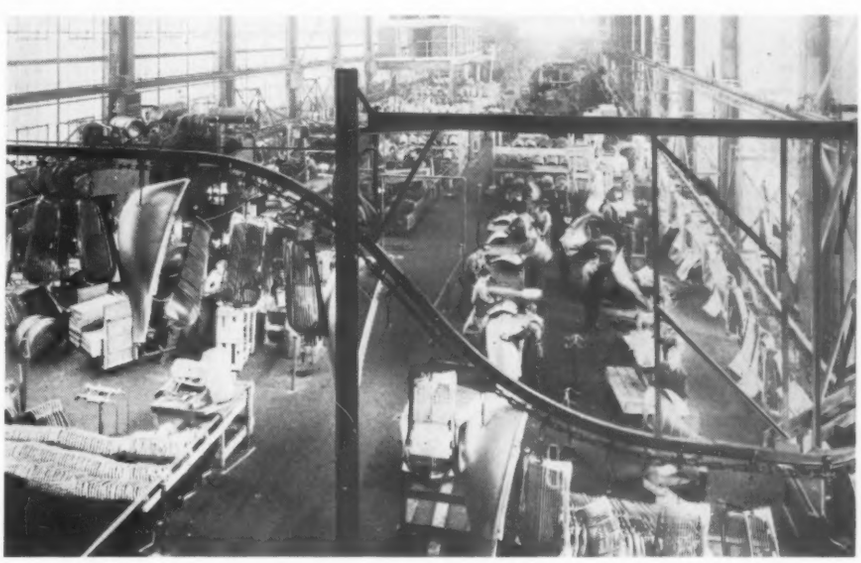
The plant is at Front street and Olney avenue in Philadelphia and has been producing automobile parts and bodies for many years. Now the expansion program will include construction of a large additional building, installation of new equipment, and other improvements, most of which have been completed during the past few months.

The plant expansion presents an interesting example of rehabilitation in which further refinement of materials handling methods and of general layout of production lines has provided a smoother flow from receipt of raw materials to shipment of finished products, aiding the company to meet increased requirements of its automotive bodies and parts trade and its growing business in stamped metal specialties. Greater flexibility of operations, notable advance in relief of congestion in plant yards and departments, reduction of hazards in handling and more all-around ease of control are among the advantages attained.

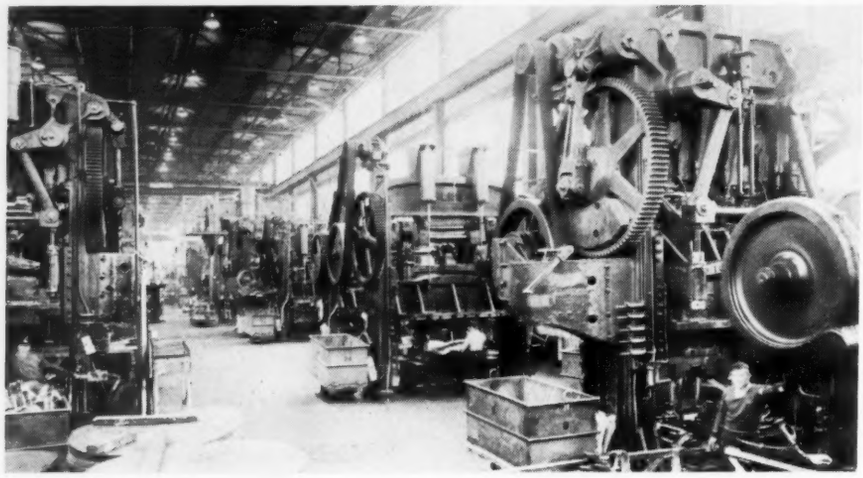
Completion of the new building furnished required space for regrouping of presses for the specialty department and provided room for installation of a simplified system for handling scrap in addition to an efficient storage department for dies, a more convenient means for steel stock storage and additional railroad switchtracks running inside the building to effect speedy shipment of scrap and finished products.

This new structure made possible departmental rearrangements to attain maximum efficiency. Setting up of the new specialties department removed congestion in the main press shop. Improved methods of handling scrap freed shipping platforms and receiving, storage and production department aisles for more productive uses. Presses in the main press shop were regrouped. By laying out a new road through the rear of the main building and connecting up with one end of the receiving department, motor trucks with incoming raw materials can be unloaded at a point convenient to point of use. By removing certain departments, a new and more efficient storage was provided for steel stock. A new overhead conveyor encircling the main press shop was installed. Other changes were made.

Now, from receipt of raw materials until the finished products are stowed in freight cars or motor trucks for shipment out, there is a straightline movement throughout the plant with a minimum of backtracking. Instead of moving incoming steel to a storage space and then back out of storage and to the shears, and later from the shears back into storage to await transfer to the press shop, all steel is unloaded immediately by electric cranes and hoists and taken to a



Main press shop of Heintz Mfg. Co., Philadelphia, showing portion of continuous overhead conveyor which travels around entire shop and serves both for transportation and storage



Close-up showing straightline arrangement of presses. Wide aisles facilitate trucking

main storage position immediately adjacent to first use.

Shears have been relocated and in front of each is provided a special steel platform on which a load of steel sheets is deposited by the crane which transports it from the freight car, or from the adjacent storage pile. Incidentally, all incoming sheets are covered carefully with waterproof paper and steel strapped to wood skids. The heavy bundles are tiered on these skids and strapping is not removed until the individual bundle is ready for use. Thus, steel is protected in storage just as it was on the rail journey to the plant. This has proved advantageous in reducing scratches and other marring defects which ordinarily cause rejects at inspection.

From receiving point, sheets are carried by crane to a scale, weighed and then taken to the shears. Thence, it is transported by truck to the next operation, the roller leveler. There are three 5-ton electric traveling cranes in the storage department so there is no delay either into or out of storage. After roller leveling, steel is taken to the press stations.

In the main press shop is the new continuous conveyor. It is approximately 1100 feet in length and is equipped with caterpillar drive. It serves a dual purpose, not only transporting parts between press operations, but also affording storage, thus assuring adequate supplies of parts at assembly stations at all times.

An important item in production is radiator grilles for automobiles. Presses are arranged in groups in a straight line down the sides of the shop. For example, at the first group the steel blank is put through four separate presses in line with one another so that there is a straightline movement from the first to the last. When the grille part is taken out of the fourth press, it is hung by the press operator on one of the hooks suspended from the continuous conveyor on which it passes to the next operation, or continues on around the shop until such time as it is needed.

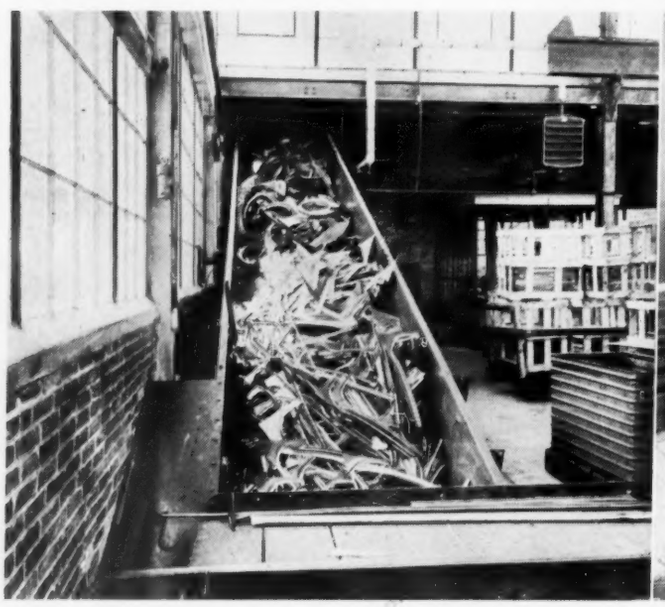
Placed on Conveyor

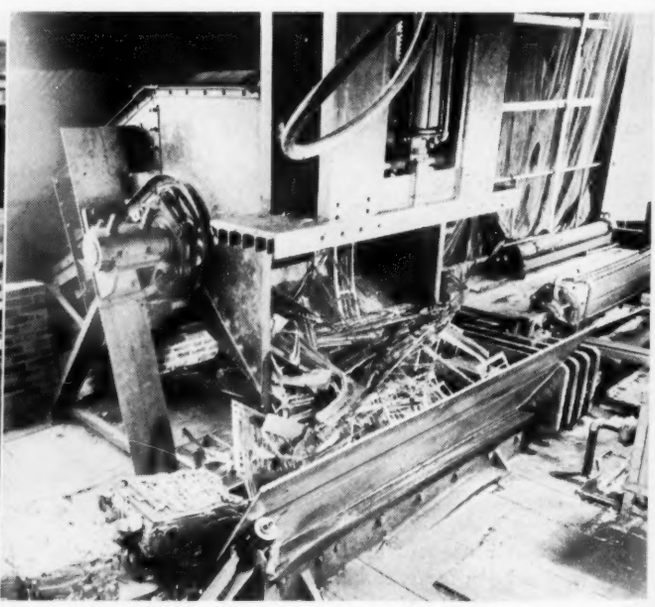
Meanwhile, other parts are stamped out similarly at other press groups and suspended on the conveyor. After press operations, parts are joined by welding; then grilles move through remaining stages of assembly and inspection. Next they are transported by electric trucks to the plating plant. It so happens that plating is performed by another company, but this plant is just east of the Heintz main building and across the railroad tracks, so it is practically a part of the continuous process at the body plant.

One significant part of the handling system in connection with the main press shop is the convenient and orderly method of storing large dies. An outdoor area, running the entire length of the press shop and just to the west of it, has been set aside for this purpose. Two 15-ton electric cranes handle the dies from the presses onto a flat truck, which runs on a narrow-gage track out a side door into the storage yard. Over the latter is a crane runway

(*Please turn to Page* 65)

Inclined conveyor transports scrap up to mezzanine floor where it drops its load into the baler





At top of conveyor, scrap falls into hydraulic baler from which it emerges automatically in 300 to 400-pound bales

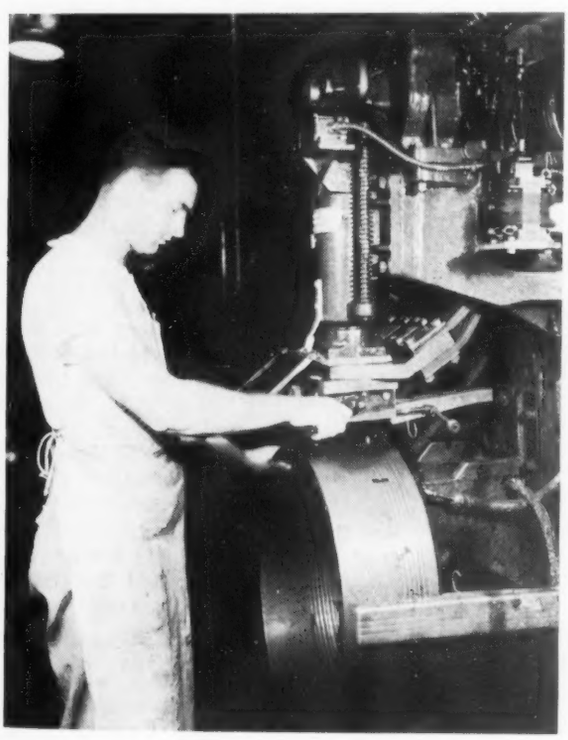
Production Is Doubled

■ WITH MANY months of actual production on which to base his figures, a washing machine manufacturer reports that installation of a new press welder to join legs to a skirt of a washing machine stand has resulted in more than double production on this work.

Each leg is attached to the skirt by six projection welds. The projections which form these welds are made on the sides of the legs as they are stamped out and formed to the smooth, rounded streamline shape visible in the illustration which shows one of the legs completely attached on the side of the skirt in the immediate foreground. Welds are formed between the edge of the steel legs and the face of the skirt.

The projection welder was made by Thomson-Gibb Electric Welding Co., Lynn, Mass., and incorporates cam operation of pressure and timing to give precise control of stroke and current dwell. It is a standard welder with the exception of minor changes in the dies and lower horn made to accommodate this particular work. A Reeves variable-speed drive affords unlimited speeds within a 3 to 1 ratio.

To make the welds, the operator fits two holes in the skirt over two pins in the lower die to align this part of the assembly. The leg is lined up and held in position in the upper die by means of a special hand clamp. Operator then steps on the movable treadle which is placed in any position on the floor most convenient for him. This trips the actuating mechanism on the welder and the parts are forced together at predetermined pressures and the weld produced automatically by the timing and current control.



Press welder used in projection welding washing machine parts. Legs are welded to skirt at a rate more than double that with previous methods employed

Arcs Are Hotter Than Sun's Surface

■ Natural-color motion pictures made with a high-speed camera (1,000 frames per second, with exposures of one ten-thousandth of a second) of arcs being struck in different gases recently were shown for the first time by Dr. C. G. Suits, General Electric research laboratory, at a dinner of the Eta Kappa Nu honorary electrical engineering society in New York.

To the eye such arcs were simply explosive, spattering, intensely brilliant sparks; as slowed down and enlarged by the camera they were revealed as brilliantly colored flames, slowly pushing out tiny, brilliantly flashing globules of molten metal and wandering gracefully around the edges of the electrodes for an interval before becoming more or less stable at the electrode tips. Flames of different colors were revealed by different gases and, in the case of oxygen, the fire was a conglomeration of a multitude of hues. Film also included views showing arcs blown sideways into graceful curves by holding small but powerful Alnico magnets near them. Each of the sequences required more than a minute for showing; actually the action had been completed in less than a second.

"It has been said that electric machinery consists of copper, iron, insulation, and arcs; the part we know the least about is the arc," said Dr. Suits, whom the society named as the outstanding young electrical engineer of 1937.

It was primarily because of the studies of electric arcs which Dr. Suits has been making that the award was made to him; he has published scientific papers describing how the extremely high temperatures of electric arcs can be measured accurately by photographing sound waves as they pass through the conducting discharge column of an arc. Temperatures in excess of 11,000 degrees Fahr., above that of the sun's surface, have been measured by him at the core of arcs, employing the sound-wave method.

Alloy Cast Iron Must Start with a Good Base

■ No alloy is a panacea to make good cast iron from poor iron—a good base iron is essential to start with. This was a contention argued by Fred C. Sefing, research laboratory, International Nickel Co. Inc., Bayonne, N. J., in addressing the March meeting of the Buffalo chapter, American Foundrymen's association. Subject of his paper was "Factors Affecting Production of Cupola Alloy Iron."

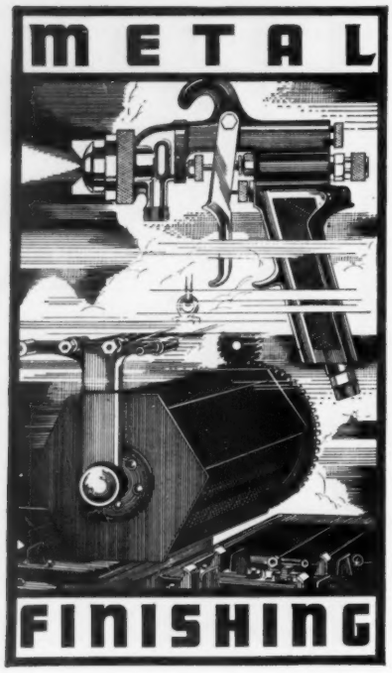
On the question of pouring temperatures, the speaker claimed that high pouring temperatures, 2600 to 2725 degrees Fahr., produce more dense and uniform irons with less tendency toward dendritic structure. Heavy and light sections should be poured with hot iron. He stated that iron poured at 2700 degrees Fahr. will show an increase of 10,000 pounds per square inch in tensile strength over the same iron poured at 2400 degrees.

Discussing alloy additions, Mr. Sefing did not favor adding over 2 per cent in the ladle, stating that larger amounts should be charged in the cupola.

Consumer Guide Out

■ A booklet entitled, "The Influence of Design on the Stress Resistance of Steel Castings" by the late R. A. Bull has been published by American Foundrymen's association, 222 West Adams street, Chicago.

Information assembled in this 62-page booklet was intended to guide those who can use the product of the steel foundry with economic advantage to themselves. It sells for 35 cents and may be obtained by addressing the association.



Impact Firing

Increased kettle life, lower fuel cost and dross loss are obtained through use of this system of firing in conjunction with these recently-designed furnaces

■ DESIGN of successful galvanizing furnaces involves consideration and balancing of a number of factors. Correct proportioning of gas and air mixture is needed to give as nearly perfect combustion as possible. Proper burning of this mixture is necessary so that the gases will be completely burned before coming in contact with the kettle surface. Proper distribution of heat throughout the length and depth of the kettle is required to give maximum kettle life, minimum dross loss and maximum efficiency. Of importance also is the determination of the correct position in the setting from which the exhaust gases are to be expelled at minimum temperature to assure maximum efficiency.

The accompanying diagram illustrates the design of a galvanizing furnace and setting utilizing the impact of firing principle and used at the plant of William B. Scaife & Sons Co., Oakmont, Pa. A study of the diagram shows how the above factors have received consideration.

An intimate mixture of gas and air is correctly proportioned and maintained by automatic proportioners or inspirators (A) which may be either the high pressure type in which the gas is the entraining medium or the low-pressure type in which air is the entraining medium. These are modifications of the Venturi tube and utilize the energy of the velocity head of one gas to draw in or inspirate the other and then convert the velocity head of the mixture to a static head suitable for the burners (B).

The homogeneous gas-air mixture is directed at an angle into pockets formed in refractory beds of lumps (C) that are loosely piled in combustion chambers (D). Here combustion takes place in the interstices of the refractory raising the entire mass to incandescence. The gas-air mixture impinges on the large surface area of this incandescent mass which acts as a catalyzer causing complete combustion in a minimum length of time and within a relatively small space.

The hot products of combustion then pass over the bridge wall (E), come in contact with the upper portion of the kettle, go down through passages (F) and give up heat by convection and conduction to the sidewalls of the kettle and to the faces of the bridge walls. Heat absorbed by these faces is radiated back to the sides of the kettle. Walls of the combustion chamber are heated to a high temperature also and radiate directly to the top portion of the kettle. This results in a maximum amount of heat being transferred to the top portion of the kettle and is done intentionally inasmuch as the hot dip galvanizing process requires most of the heat input in the top since all of the cold work enters the bath at the top and radiation losses from the surface of the bath are localized at the top.

However, it is essential that the size of burners, combustion chamber and kettle for the required production and size of passages for flue gases be carefully proportioned to prevent creation of zones of localized overheating which would tend to burn out the kettle at those points. In addition, an ample number of burners distributed at close intervals along the sides of the kettle provide for uniform heat distribution along the length.

Products of combustion after giving up most of their heat pass over baffles (G) which shield the bottom of the kettle at the dross line to prevent dross agitation. The products of combustion then pass into the longitudinal flues (H) and thence out of the setting to a flue and stack.

Brick walls are made of such section that the heat stored within them is at a minimum. This reduces flywheel effect or thermal inertia, an important consideration where the

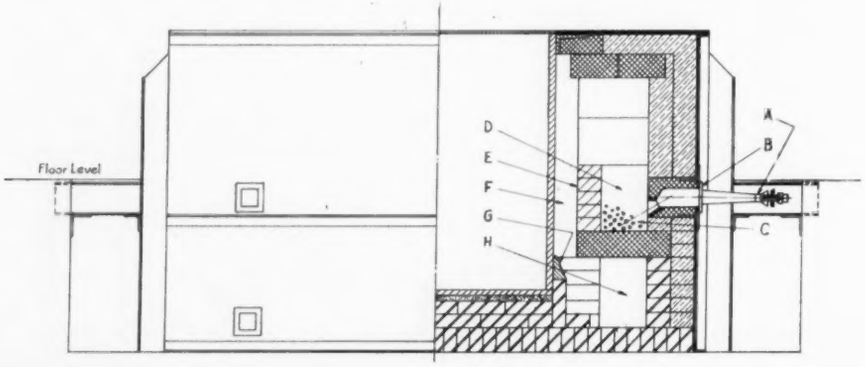


Diagram showing arrangement of elements of impact firing furnace

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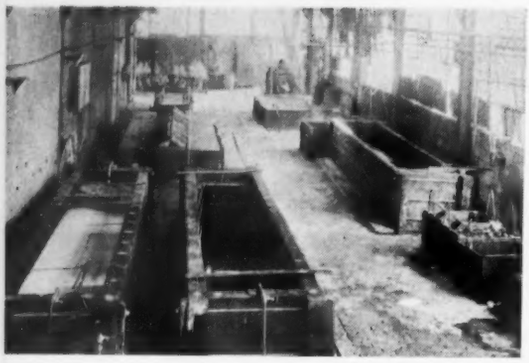


Pickling department handling tanks for galvanizing at plant of William B. Scaife & Sons Co., Oakmont, Pa.

operating rate of the furnace must change over a wide range, such as in this case.

At William B. Scaife & Sons Co., galvanized steel tanks in a wide range of sizes are manufactured. Here the galvanizing equipment must handle tanks ranging from 6 inches in diameter by 12 inches in length to 36 inches diameter by 13 feet length. Plate thicknesses vary between 0.062 and 0.750-inch and tank weights range from 20 to 1500 pounds. The majority of the work handled consists of range boilers for domestic use, 12 or 16 inches in diameter by 3 or 5 feet in length and weighing between 60 and 120 pounds.

However, it is necessary that the extreme variations mentioned above be correctly handled which means the galvanizing furnaces must be served by suitable burner equipment to give the widest turn-down possible. Kettles are of proper size with 10 burners located on each side and so manifolded and interlocked that a constant temperature can be maintained in the bath automatically at all rates of production ranging from a maximum with all burners running full to a low idling rate during week-end shutdowns when only a few of the burners are utilized, these being turned low.

Procedure employed at this plant is as follows: Tanks are pickled horizontally to avoid air pockets and to permit a thorough cleaning action. When scale has been removed, tanks are picked up in groups on a carrier bar, carried on a monorail hoist to a water bath, placed in this bath in groups and removed in order, thus allowing a soaking period.

Tanks next go to the fluxing bath, a solution of hydrochloric acid in water, and to a dry oven where they are removed from the carrier bar and allowed to roll through. This drying or preheating oven removes moisture from the tanks before they are galvanized.

The galvanizing kettle is divided by a guard plate or dam across the center and resting on the side walls of the kettle. This plate is notched at the sides so the center portion is immersed in the zinc for a short distance and acts to keep the flux confined to the entrance end of the kettle.

Fill with Zinc

Tanks enter through the flux blanket in such a way that they are filled with zinc rapidly. Then they are pulled under the dam into the front or discharging half of the kettle where a hook inserted in one of the tank openings is used to lift the tank out of the kettle.

Spelter is allowed to drain while the tank is held over the kettle. It is lowered to a horizontal position and dropped to parallel rails where it is inspected both inside and out for any spots that may not have been thoroughly galvanized. Any oxide spots are removed and the tank rolled away.

Pickling is done in a sulphuric acid solution ranging from 3 to 8 per cent in strength. A very slight etching is sought to insure good bonding of the coating. The etch, however, must not be too deep since an excess of zinc cannot be rolled off as in sheet galvanizing. Careful rinsing was found to solve the carry-over problem.

Fluxing is effected by a hydrochloric acid dip and, after drying, by a blanket of salammoniac over the spelter bath. Other methods of fluxing were tried but have not shown any particular advantages over this method.

Use of these impact, bed firing furnaces, patented, designed and installed by Pennsylvania Industrial Engineers Inc., 2413 West Magnolia street, Pittsburgh, now has brought a reduction in fuel cost and dross loss as well as an increase in kettle life. This method of firing is being extended to include heating of other molten baths, such as lead pots, salt pots and the like.

Typical installation of impact firing furnace used for hot dip galvanizing work. Range boilers for domestic use are being handled here

Satin Finished Monel Sheet Now Available

■ A new monel sheet featuring a uniform satin finish and having special qualities of temper and durability has been announced by International Nickel Co., 67 Wall Street, New York. It is known as No. 35 and is said to be especially suitable for hospital and food service equipment and other applications where appearance and fine finish are required. Despite its increased hardness, it can be readily fabricated as monel does not readily cold harden, it is explained. Composition is approximately two-thirds nickel and one-third copper.

Should Develop Standards For Plating Chemicals

■ There is a need for a set of standards for chemicals used in electroplating work, according to M. W. Schwarz, consulting chemical engineer, New York. In an article in October issue of *Metal Industry* he says that electroplating shops are being called upon to meet definite standards in work produced without the aid of standards to help them in using chemicals required.

A set of standards for chemicals would not only help the plater to obtain more uniform results but would generally improve plating practice, he points out. That such standards are practical has been shown by their wide use in other fields. Mr. Schwarz suggests that a survey be made made of present standards, followed by subsequent correlation and amplification where needed. Then with standard methods of analysis and test agreed upon, the much needed uniformity would become possible.

New 98-Inch Strip Mill

(*Concluded from Page* 41)

stands at once, it frequently puts a double load on all motors, entailing a serious problem of power factor correction. With finishing stands empty, synchronous motor excitation must be low yet be sufficient to prevent stalling when sheet enters the stand. With stands full, maximum excitation is required so excitation is varied automatically as load changes, effecting minimum disturbance to power system. This benefits voltage regulation and makes for minimum power charges.

Altogether there are 1420 motors, from the 4500-horsepower finishing stand motors, largest ever used on a strip mill, to so-called flea-powder motors, operating clocks. Fifty-eight motors are 100 horsepower or more and 23 are 1000 horsepower or more. Total is 123,000 horsepower.

Mill-type direct-current motors used on run-out tables are totally enclosed, shunt wound, ball bearing type, 4.5 horsepower or less on table rollers, 25 horsepower or less on coiler rollers. Ward-Leonard control is used. These replace induction motors and variable-frequency motor-generator sets usually employed for this service. Direct-current motors eliminate conversion losses of motor-generator sets, rotor losses of squirrel cage motors, and simplify control apparatus, as well as save substation space. Only two 1000-kilowatt motor-generator sets are required for run-out and coiler motors.

Hot mill motor room, 576 x 65 feet, containing five of the seven motor-generator sets and all hot mill main drive motors, is said to house largest concentration of electrical rotating machinery, in power per square foot, of any industrial plant. One control desk in motor room handles all equipment.

All motor-generator sets and mill motors proper are cooled by recirculating air in a closed ventilating system, each unit or group being cooled by its own coolers located in basement. Cooling main drive motors and motor-generator sets in hot mill motor room alone requires 500,000 cubic feet of air per minute. To make up for leakage losses 5 per cent is taken from outside.

Oil circuit breakers for 11,000 and 2300-volt equipment are metal clad and located on main floor of motor room. All buses are aluminum channel. Wherever possible, cable was installed in conduit and imbedded in concrete. All cable, except overhead power feeders for general service, is lead-covered. There are six control houses for auxiliary motor control in hot mill buildings, two in pickling building and two in cold mill building.

Mill buildings are high-roof industrial type, with a maximum amount of window space for natural lighting. Artificial lighting is said to be better than any other steel mill. It is about half Mazda and half high-intensity mercury in alternate units. A minimum of 7 foot-candles is provided with 15-foot candles used generally. For mill buildings proper, lighting load is about 900 kilowatts.

More than 750,000 feet or 143 miles of conduit and 1,200,000 feet or 227 miles of wire and cable are installed. Total length of wire drawn to make stranded cable was more than 12,365 miles.

Welding is used extensively in machinery and equipment throughout the plant. Foot brakes, cranes, railings, scrap boxes, equalizer hooks, brackets and so on are welded. Main water pipes, hydraulic pipe lines and oil piping also are welded.

The hydro-pneumatic accumulator is made of three longitudinal plates with a total thickness of 4 inches. Plates are perfect sheets of steel carefully inspected by X-ray, and all welds were X-rayed for possible defects. Working pressure is 1500 pounds per square inch. Total weight is 40 tons including 2 tons of welding metal.

Another unusual welded unit is the 20-ton, 31-foot roll-changing hook used for changing mill stand rolls, some of which weigh 50 tons. Hook consists of a welded post and a cast steel roll sleeve, welded together. The post, shaped like an inverted "L" and fabricated of low carbon steel plate 1½ inches thick, has a cross section 30 x 40 inches and a total height of 21 feet 4 inches. Arm at top is 16 feet 7 inches long. Post was first fabricated in two longitudinal sections which were then welded together at the neutral axis. The cast steel roll sleeve is 6 feet 4 inches high and weighs 6½ tons.

The 350,000-gallon standpipe, 125 feet high and 22 feet in diameter, was butt welded in the field. It contains 16 rings of 93½-inch plate rolled to shape. Plates which form ring sections are approximately 23 feet long and vary in thickness from ¼ to ⅝-inch.

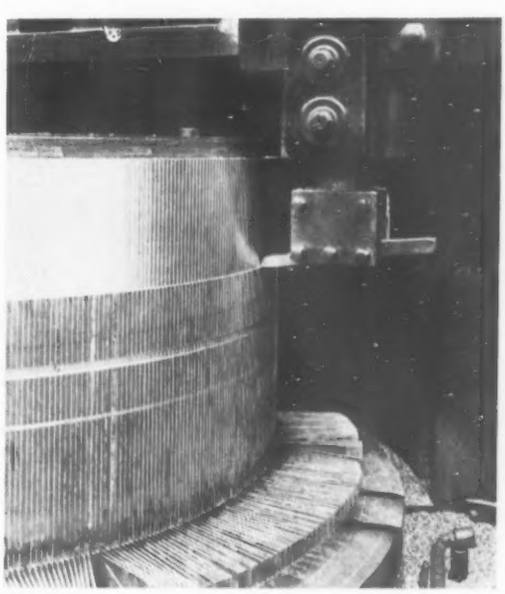
Welding made possible the extra large annealing covers used in the annealing process, some of which are 10 feet wide, 8 feet 8 inches high and 24 feet long.

The 12 tanks in pickling lines, largest of which are 4 feet 10½ inches high, 8 feet 10 inches wide and 61 feet long, are welded. They were fabricated of standard structural steel channels, angles, beams and ⅜-inch plates.

Mill buildings, including machine shop, scale pit and pump house, are equipped with 27 electrically-operated overhead cranes. Span between crane rails in mill buildings proper is 105 feet, 65 feet in motor room and 85 feet in hot mill. Both of the two hot mill cranes are 75-ton capacity. In cold mill there is a 60-ton and a 10-ton crane, and in annealing buildings two 35-ton cranes. Motor room crane has 50-ton capacity. All four large units have 10-ton auxiliary hooks. Slab yard building has two 25-ton cranes which use either chains or magnets. Plant also includes a 25-ton crane in cold mill motor room and six 15-ton, nine 10-ton and two 5-ton units.

Cutting Tool Travels 4400 Miles

■ For seven years this carboloy-tipped tool on a large boring mill in General Electric Co., Schenectady, N. Y., plant has been used for turning the outside diameter of motor and generator commutators. It has turned more than 800 commutators, involving 4400 miles of cutting copper and mica alternately



By ROBERT E. KINKEAD

On this page the author, well-known consulting engineer in welding is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

Action Is in Order Not Childish Complaints

■ No exception to men in other industries, a group of business men engaged in welding were recently discussing the present situation in the hope of making some sense out of it. It occurred to us that many of the complaints were infantile. Some thought that the government ought to do something, others thought the government ought to sever all connections with business and let the thing work itself out. One man had worked himself around to the point at which he seemed to think that Mr. Hitler's way of doing things is not so bad after all.

It seems to us that these men's troubles arise from their major premise that this is a reasonable world and that this or any future situation in which we find ourselves should make sense. There are better reasons for believing that conditions at any given moment are the resultant of many forces which operate in a multitude of directions. Since the amount and direction of most of these forces is beyond human comprehension at present a business man may not reasonably expect any set of conditions to make sense but must deal with them as he sees them from day to day. The danger to the business man of waiting until the situation makes sense, as he says, is that while he waits, his pile melts away and by the time the conditions suit him he may not be in a position to do anything about it. It has always been this way—the present situation is nothing new.

Not to work with the government is for the business man to let the politicians run hog wild with the county's wealth and the people's liberty. Every government will spend as much as it can and grab all the power it can get unless restrained by people who know better.

The situation can be made to look reasonably sensible if every business man would spend much of his time trying to improve his own business and some of the rest working with government officals to keep them from doing the things that have brought about the present conditions.

More Imagination Needed In Welding Meetings

■ The American Welding Society is, through its section meetings, the meeting place for engineers and executives in industry who are interested in some phase of welding. Yet a surprisingly large number of executives who are vitally concerned with welding fail to attend the meetings. It has occurred to many that the nature of the meetings might be changed to increase the service of the society to industry. It seems rather fundamental that no one would miss a meeting if he thought he would learn important facts in connection with his business. If they do not come, it is a fair assumption that there is something about the character of the meeting that needs improving.

Specialized technical information is valuable and necessary as a component of the public offerings at the section meetings. The difficulty appears to be that nothing else is offered. Certainly engineers and technical men are not so benighted as to be unaware of what is going on around them in the economic world. Following a presentation of specialized technical information it is perfectly sound engineering to inquire—so what? What do these facts mean? How do they connect up with the economic life of the people at large? How can they be applied to give employment and permit business men to earn profits and create more employment?

When an executive says, "No, I will not come myself, but I will send some of my engineers and production men," the program committee has done a poor job. It has not used enough imagination to interest the man who can do something.

Table Top Is Nickel-Clad Steel

■ **Standard tubs of butter weighing 65 pounds each are delivered and brought down heavily upon a table top of 3/13-inch, 10 per cent nickel-clad steel to remove butter from tubs. Butter is then slid along surface to trough which is also equipped with guides of nickel-clad steel. It is said that table top stands up well under rough service, does not stain butter and is easily kept clean. Odors caused by former wooden table tops was also thus eliminated. Courtesy Lukens Steel Co., Coatesville, Pa.**

Whitey Sez:

"Achievement is the composite result of many little things well done and well put together . . . Precise laboratory check of every minute detail in the making of alloy steel used in my product – ranks the MAURATH ELECTRODE *an achievement in welding science."*

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C L E V E L A N D

New Grain Refiner Produces Clean, Sound, Tough Steel

■ Silvaz grain refiner, a new ferroalloy containing approximately 45 per cent silicon, 7 aluminum, 7 vanadium, and 7 zirconium has been placed on the market by Electro Metallurgical Co., unit of Union Carbide & Carbon Corp., New York, for grain refinement and deoxidation of steel and for strengthening cast iron.

In steel making, this grain refiner was developed to eliminate the need for the addition of ordinary ferrosilicon plus a separate deoxidizing metal such as aluminum. Although available data clearly indicate some of the advantages of this grain refiner in grain refinement, its utility in iron and steel castings still is being developed.

Development Successful

Laboratory work, as well as experiments on commercial steels, show that the new development consistently produces a fine-grained structure in steel without the formation of harmful, segregated inclusions (see Figs. 1 and 2). This is an unusual property, the company states, because most other grain refiners, except vanadium, tend to form these inclusions when added in quantities sufficient to be effective in controlling the grain. The absence of such inclusions in steels that are to be machined should result in longer tool life. Beneficial character of Silvaz grain refiner additions is reported shown by improved mechanical properties in the steels to which it is added. Deep etching tests (see Figs. 3 and 4) show this grain refiner tends to promote soundness and freedom from porosity.

High In Ductility

Silvaz treated steels are said to be exceptionally high both in ductility and impact strength. The impact strength, particularly, stated as much higher in steel treated with the refiner than in comparable steel treated with aluminum. The benefit in ductility is usually less outstanding than the increase in impact strength. This higher capacity for deformation has been reported regardless of the type of heat treatment (see Figs. 5 and 6). No case has been encountered, the company says, in which Silvaz grain refiner has failed to produce the intended effect.

"It is believed," the company states, "that this behavior is due both to a desirable combination of deoxidizers and to the fact that they are carried in ferrosilicon, so that more efficient use of the alloys is assured. Although the reasons for improved results with Silvaz grain refiner are not entirely obvious, it produces cleaner, sounder, and tougher fine-grained steel than with other deoxidizers."

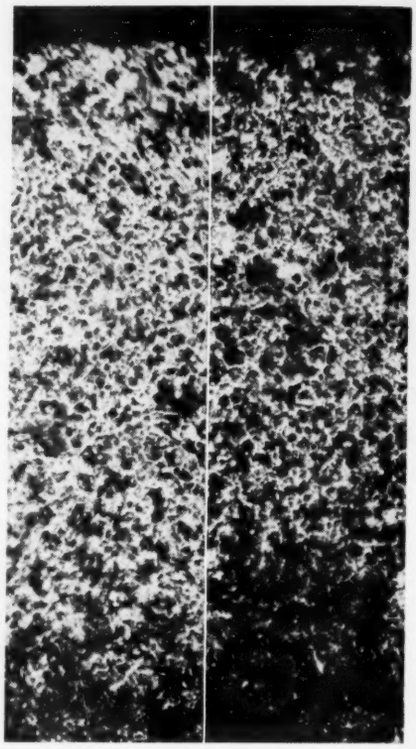

Fig. 5 (left)—Structure of carburized case of SAE 1330 steel treated with Silvaz grain refiner, magnification 100 X. Its grain-refining effect remains regardless of type of heat treatment. Fig. 6 (right)—Structure of carburized case of SAE 1330 steel treated with aluminum, magnification 100 X

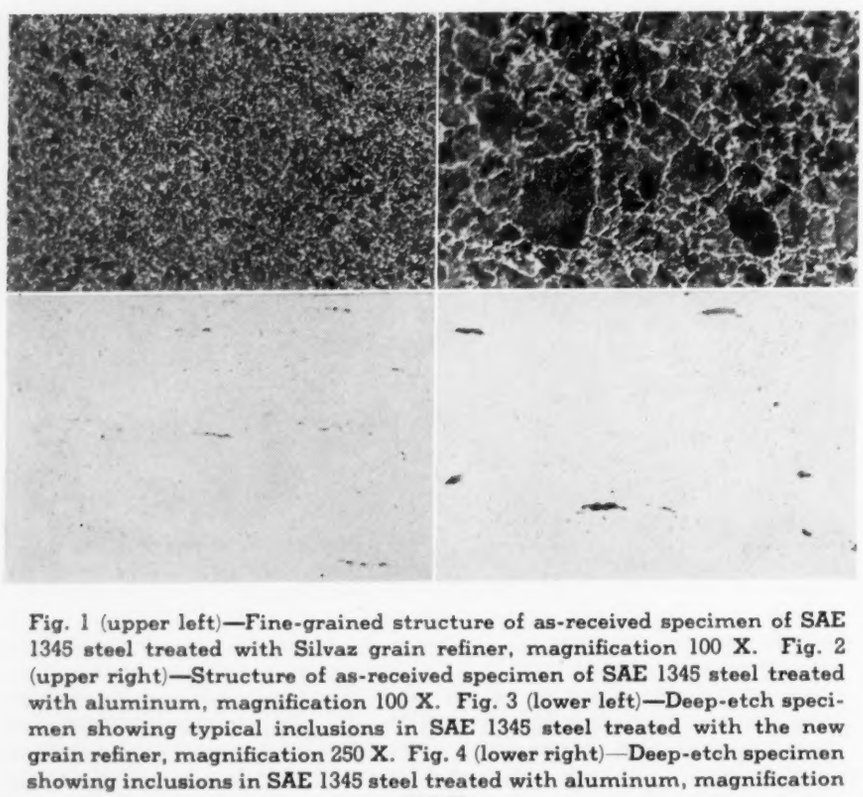

Fig. 1 (upper left)—Fine-grained structure of as-received specimen of SAE 1345 steel treated with Silvaz grain refiner, magnification 100 X. Fig. 2 (upper right)—Structure of as-received specimen of SAE 1345 steel treated with aluminum, magnification 100 X. Fig. 3 (lower left)—Deep-etch specimen showing typical inclusions in SAE 1345 steel treated with the new grain refiner, magnification 250 X. Fig. 4 (lower right)—Deep-etch specimen showing inclusions in SAE 1345 steel treated with aluminum, magnification 250 X

Unusual Applications Of Iron in Cement

■ Two somewhat unusual applications of iron are found in patents recently issued Connelly Iron Sponge & Governor Co., Chicago. One of these covers an iron compound consisting of finely powdered iron particles and a rust accelerating agent. Applied to a rough concrete wall surface, the iron oxidizes and expands into the crevices and pores of the concrete forming a waterproof surface.

The second covers the preparation of finely pulverized iron granules which are troweled into the finish coat on concrete floor surfaces to give increased hardness, wear resistance and elimination of "dusting." This material is chemically treated to remove zinc and aluminum which if allowed to remain, react with the cement causing gas to rise and form blowholes and defects in the finished surface.

Flawless Performance

AT EVERY POINT IN THE RANGE

FROM LIGHT-GAUGE WELDING UP TO HEAVY PLATE

Like having an arc welder specially designed for every job

IMAGINE scores of direct-current arc welders, each one built to give perfect performance at a different point in the welding range. Then imagine all of these sets molded into one—one unit that gives flawless performance at *every* point in the range. There you have a picture of the General Electric arc welder.

Experienced welding operators know that arc pop-outs, sticking electrodes, and excess spatter waste their time. This is why they hail the improved G-E arc welder as the set for which they've been waiting.

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1. *The arc is easier to strike—no sticking of the electrode.*
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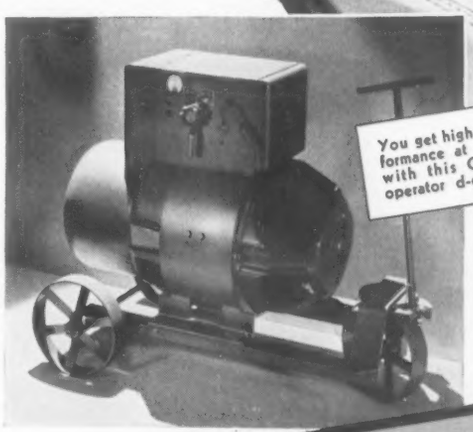
3. *It gives a "peppy," continuous arc—there are no arc pop-outs.*

Important savings are thus made in both time and electrodes—items that account for the major part of welding costs. AND—with the G-E machine—you get these advantages not only under favorable conditions but at every part of the entire welding range.

Why not arrange for a demonstration of this set today? Call the nearest G-E arc-welding distributor or sales office. Or fill out and send the coupon. We shall be glad to give you more information. General Electric Company, Schenectady, N. Y.



General Electric, Dept. 6B-201, Schenectady, N. Y.

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☐ GEA-1440F, describing G-E single-operator motor-and engine-driven d-c welders

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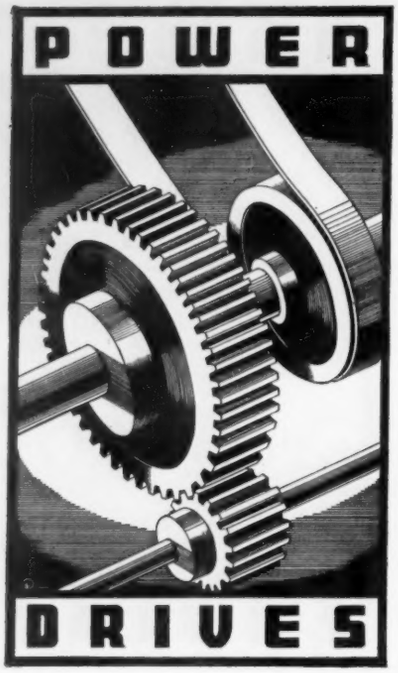


Friction Losses

Of two tests used in determining lineshaft losses, the common determination was found to deviate so much from the results of the second test that both are being questioned

■ TESTS TO DETERMINE friction losses in lineshafts are commonly assumed to be the total power consumption when the lineshafts are operating with all machines idle. That this method results in overrating the lineshaft friction losses is well shown in a report of tests made in an eastern metalworking plant.

In this plant the entire group of shafts were interconnected by belts and ropes to be driven from a single 75-horsepower motor. Tests of power consumption indicated a day working load averaging 80 horsepower, an exceptionally good load on the 75-horsepower motor.

Compared to this the no-load or lineshaft running idle was found to be 54.3 horsepower. This so-called friction loss is almost 68 per cent of the total full load power consumption. If this consumption is correct the friction losses are more than double the useful working load.

Some load tests made by F. E. Butterfield, industrial equipment engineer, Commonwealth Edison Co., Chicago, as published in STEEL, page 58, June 28, 1937, indicated that lineshaft or no-load friction losses are not as high as commonly believed and are not determined correctly.

By taking power consumption readings with all machines idle, the commonly accepted method of determining such friction losses, the no-load losses were found to be approximately 50 per cent of the full load with all machines operating. Additional tests to determine consumption of individual machines while operating one at a time indicated individual use of power far too low to be reasonable.

Procedure Reversed

As a check, Mr. Butterfield reversed the usual procedure by operating all machines to obtain full load consumption and then operating with only one machine idle at a time. He took the difference as the consumption of each machine. The sum of these differences was assumed to be the actual power consumption of the machines, and the balance to be motor and lineshaft losses. The field losses of the motor were determined separately and not included in either case as lineshaft friction losses. This gave a total lineshaft friction loss of approximately 11 per cent of the total full load with all machines in operation.

The difference in lineshaft losses (approximately 50 per cent and 11 per cent respectively) is too great to pass by without questioning the correctness of either the old or the new reasoning. Considering the two methods impartially, the second would seem to be more scientific. Also, it gave better and more

Assembly Line in Store Window

■ **During the American Gas association convention in Cleveland, this unusual window display in a local store attracted interest. Cleveland Co-Operative Stove Co. designed and built the display which consisted of a small but complete stove assembly line with an expert mechanic actually assembling gas ranges in the window. Background consisted of photographic panels depicting phases of gas range manufacturing**

responsible results as to power consumption of individual machines.

In explanation, Mr. Butterfield expressed the theory that lineshafts running idle had no reaction from the load to pull the shaft into its best operating groove into which it had worn itself in years of service. This theory may not be correct but it would aid in explaining the high starting load. If any readers have made similar tests STEEL would appreciate any discussion or opinions.

Lineshaft Supported From Light Roof Trusses

■ Frequently plants find it necessary to install production equipment in buildings of light construction where the roof trusses are not able to carry the weight of a lineshaft and the supporting superstructure, or trusses are too widely spaced. Often such conditions have required the use of all-individual motor drives.

In practically all cases, however, the lineshaft can be supported from the ceiling or roof trusses by using pipe supports to hold up the lineshaft superstructure. The channels or other steel superstructure are attached to the roof trusses, as is the usual procedure. The hangers and shaft are installed, but before aligning or belting up, sag is taken out by adding pipe supports resting on the floor to hold up the stringers.

It is not necessary to place these supports exactly in the center of the spans although this would be the preferred location. Usually the supports may be shifted a short distance to one side or the other so that they will not interfere with any machines or their operation. In some cases pipe supports are necessary even under the trusses. The need for this extra support may be determined by calculating the strength of the truss and its permissible load with allowance for snow load.

Pipe Sufficient

Usually a 3-inch pipe flanged at both ends is sufficient. A short I-beam is placed crossways under the stringers and the pipe support set up beneath. The easiest method of attaching the cross I-beam support and flanges is by tack welding. However, they may be bolted. Slight adjustment to eliminate any sag in the stringers due to long span or in the trusses is made by screwing the pipe in or out of the flanges. When the stringers are leveled up, the shaft is aligned. Pipe supports are usually set 1 or 2 inches from the shaft so as not to interfere with alignment. Careful planning will prevent a pipe support from interfering with pulleys or belts. The pipe is easily moved if future changes should make it necessary.

Even though these pipe supports are not spaced exactly any difference is not noticeable. Such supports make the roof trusses much stronger than before.

Motors or Special Drives For Variable Speeds

■ One of the most common reasons for the use of direct-current motors is to provide variable speed adjustment on machine drives.

In plants where only a few such motors are installed some means, such as a motor-generator set, are required to provide the direct current. This is an additional expense.

General experience in plants using direct-current motors is that they require greater maintenance of both motor and more complicated control than do single-speed alternating motors. Some plant engineers disagree on this point, although all admit that direct-current equipment requires greater skill and experience in adjustment, inspection and servicing than do alternating current units under similar operating conditions.

Where variable speed is the problem, many plant engineers are using alternating-current motors, usually of standard induction type, with a variable speed transmission. This gets away from the necessity of providing direct current with separate feeder lines and utilizes less troublesome equipment in the drive.

The variable speed transmission unit gives an infinite number of minute steps or changes in speed, while the direct-current motor gives speed adjustments in definite steps, usually two or four different speeds. Also, the direct-current motor and its control is considerably more expensive than corresponding alternating-current motors and control. The possibilities of closer adjustments in speed with a variable speed unit permit selecting easily the most suitable speeds for any work and as easily and quickly changing speed with any variation in work.

In a recently-developed, special roller leveler for leveling stainless strip steel from coils, a 4 to 1 ratio, positive, infinitely variable speed transmission is used with an alternating-current motor instead of a 4 to 1 ratio, adjustable speed motor. This unit permits adjusting the leveling speeds to any point between 3 to 12 feet per minute to meet the varying requirements of gage or width of steel in the leveler.

Speed Changes Increased

■ A change in design and material of a heavy, machined part required taking heavier cuts on a lathe driven from a countershaft and lineshaft. The belt would not carry the increased load although the lathe was of ample size to handle the work.

To permit installing a larger belt step-cone pulleys on countershaft and lathe were changed from six to four steps. An individual motor with extended shaft was installed to drive the countershaft instead of belting to lineshaft. To get the full range of speeds two drive pulleys on the countershaft were replaced with silent chain gears of different diameters and connected to sprockets on the extended motor shaft.

With this arrangement all drive speeds were in one direction with no reverse, as is used for threading. As the lathe was used only for turning, facing and boring, the reverse for threading was not necessary. This arrangement gave eight changes of speed, plus the backgears, instead of the six changes possible with the former arrangement.

♦

One cash credit to the maintenance department may be earned by careful collection and sale of scrap copper, brass and other material salvaged in dismantling and repair work.

♦

Time is an important element in emergency repairs, therefore, the men must form quick judgment as to the best method, considering time required and permanency. Nothing will demoralize a maintenance force more, however, than repeatedly "bawling out" the men for the way they handle their work under stress.

♦

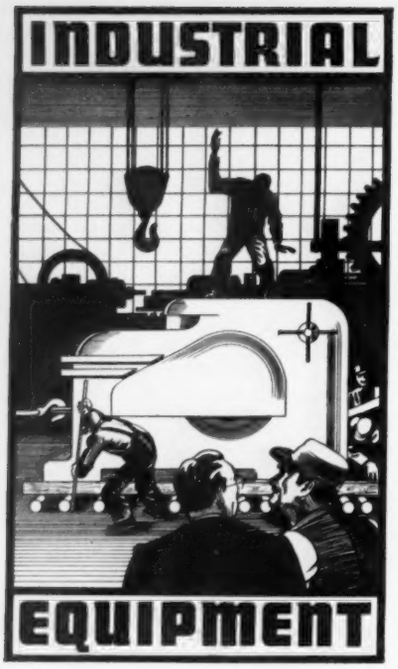
Instead of destroying stock cards of pulleys, gears, couplings, etc., when taken from spare stock, one plant engineer notes the new location and files in a separate file. When a call comes for a part and none are shown in stock, reference to the other file often indicates a unit which has been used in connection with less important equipment and may be "robbed" temporarily. This saves considerable time in running around the shop with a rule to measure up equipment that might yield the required part.

♦

Instead of fabricating brackets for mounting motors on the wall, ordinary wall brackets, as used for wall mounting lineshaft hangers, are usually less expensive. These have a T-groove for bolting down the motor or motor base.

♦

Maintenance service is only as strong as its weakest link. As much attention and thought should be given to the organization of this department as to that of production.



Milling Machine's Movements Synchronized

■ Producto Machine Co., Bridgeport, Conn., has placed on the market a cam operated, automatic milling machine which has four separate heavy duty, cutter spindle bearings carrying cutter arbors in a horizontal position. The arbors have a vertical motion. Table of the miller which moves longitudinally, has its movements synchronized with those of the cams.

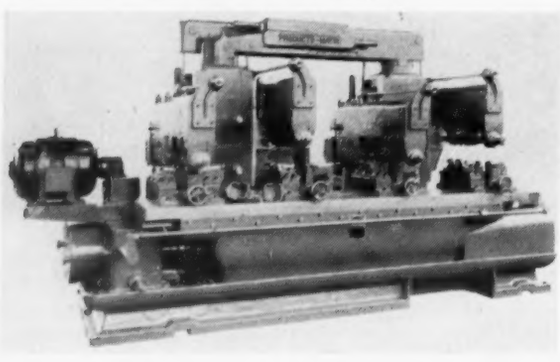
The illustrated machine shows four separate stations or work fixtures, each being directly under one group of cutters. Two of the work fixtures are in milling position and two are in loading position. These positions never vary and also enable the operator to alternate between each two groups in loading and unloading the work.

The two vertical columns are connected by a bridge. These columns, in turn, support two heavy-duty cutter spindle assemblies with worm gear drive. Cam drums which govern the movement of the cutters also are located in each column. Chains and springs counterbalance the cutters and spindle assemblies.

Action of machine consists of two cutter spindle assemblies feeding downward to the proper depth of cut and coming to a positive stop. Table then automatically travels longitudinally for the required length of cut. After cut has been taken, cutters rise out of the work, trip mechanism stops rotation of cutters and the table moves back for milling the second group of two parts.

Operator has full control of machine at any point by means of a long starting lever. Different lengths of table travel are obtained by removing a cam drum from the end of a large drive shaft located on the right side of the unit.

Machine is driven by a 15-horsepower motor through a transmission gear box using change gears for both feed and speed changes. Automatic stop mechanism is used for cutters, facilitating loading and eliminating risk of being cut by the cutters. Overall length of the machine base is 140 inches. Its total weight is 30,000 pounds. The cutters travel 8 inches and the table has a longitudinal movement of 16 inches.



This Producto-Matic miller is 48 inches wide and has an overall base length of 140 inches. It is powered by a 15-horsepower motor

Internal Attachment Featured on Grinder

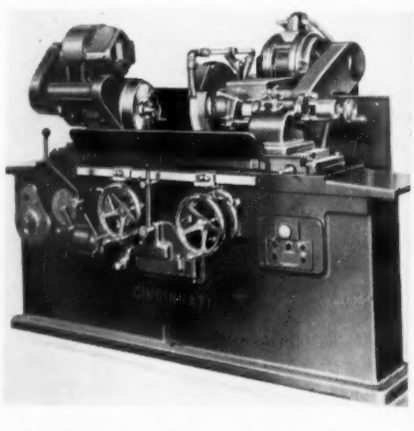
■ Cincinnati Milling Machine & Cincinnati Grinders Inc., Cincinnati, has placed on the market Universal grinding machines which are built in 12 and 16-inch sizes with 24, 36, and 72 inches between-center lengths. Grinder is arranged for either a fixed or swinging frame, internal grinding attachment. Fixed attachment, driven from a pulley mounted on the motor sheave, is supplied as standard equipment.

Bearings of the unit are of the multiple shoe type and are self compensating for load changes. A small motor mounted on the wheel head controls the lubricating system. Oil is drawn from a built-in reservoir and pumped first through a renewable filter and then to the bearings, filling the space around them. As pressure is built up to 4 pounds, pressure switch starts main drive motor. Failure of system stops the motor.

Grinding wheel spindle is driven by a motor mounted on the wheel head through the medium of multiple V-belts. Internal attachment is driven by the same motor. Headstock unit acts through power transmitted from the motor to the face plate by V-belts and silent chain drive. Motor is of the ¾-horsepower variable speed type mounted on a vibration absorbing, shelf-type rachet. This unit can be swiveled through an angle of 150 degrees for face and angle grinding. It has work speeds ranging from 60 to 240 revolutions per minute.

Electrical push button controls are provided for all machine movements. These are built in flush with the front of the bed. Bed is a one piece casting, long enough to provide support for the table when the maximum length of travel is being used.

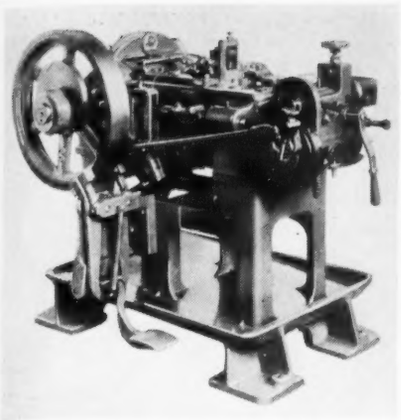
Wheel head unit provides adjustment of the wheel to the work through square gibbed slides and narrow guides. This unit may be swiveled through an angle of 90 degrees either side of center. Motion is transmitted to the table by means of rack and pinion. A multiple disc clutch on the shaft of the table driving pinion eliminates the shock reversal. Alignment between the headstock and footstock units is obtained by means of a truncated locating V, machined in the top of the table. Table swivel adjustment ranges from 10 degrees forward to 2 degrees back.



Cincinnati grinding machine is equipped with a coolant pump driven by a ⅛-horsepower motor which is capable of delivering 15 gallons of coolant per minute

Header Produces Rivets With One Operation

■ E. J. Manville Machine Co., Waterbury, Conn., has introduced a



Frame of this Manville high speed header is of rigid construction. It has a normal production rate of 150 blanks per minute

high speed header which produces tubular rivets in a single station operation of two blows.

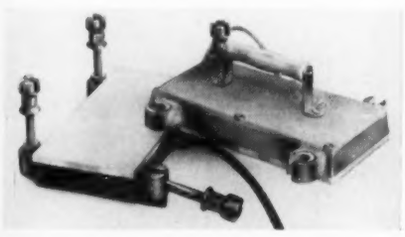
Machine punches an extended hole in the blank while it is held in the same position as it occupies when headed. This eliminates the complications of transferring the work from one set of tools to another, and also previous drilling operations.

Normal rate of production is 150 blanks per minute with a maximum size of 3/16 x ⅝ inches. Frame of machine is of rigid construction, and choice of gravity or forced feed lubrication and drive arrangement is optional.

Belt Vulcanizer Has Double Platens

■ Ton-tex Corp., 129 West Twenty-Second street, New York, has placed on the market a portable, lightweight double-heat platen belt vulcanizer which vulcanizes fabric or rubber belts in a smooth continuous belt.

Vulcanizer can be used on the



For operating in places which are difficult to reach, this Ton-Tex vulcanizer may be suspended from overhead by a chain hoist or a simple rope attached to its handle

work bench or on belts which are in place on the machines. Weighing only 36½ pounds it is easily moved about. Both upper and lower platens of the vulcanizer are heated, reducing vulcanizing time by one third, it is said.

Unit uses either alternating or direct current and is ready for operation 30 minutes after being plugged into the current. It also is equipped with a thermostat to keep the vulcanizing temperature range while in service.

In operating, upper platen is swung edgewise off from the lower platen, the single permanent bolt acting as the axis. Then lapped ends of the belt, with cement applied, are laid on the lower platen. The upper platen is swung back into position and clamping pressure is applied by four nuts which may be turned with a wrench or screw driver.

Capacity of the unit is up to 7-inch belts in one operation, or 10-inch belts in two operations. This includes almost all of the power transmission sizes.

Plane Handles Additional Jobs

■ Lufkin Rule Co., Saginaw, Mich., has introduced a Master planer and sharper gage which can be used for jobs other than those handled by ordinary planers.

Used as a planer gage the tool facilitates adjusting depth of first cut and setting tools for other cuts. Proper cut is obtained by setting the gage to a micrometer, surface gage or caliper, and then bringing planer tool in contact with it. With the extension, tool settings from ¼ to 9 inches can be made.

Gage also serves as an adjustable sliding parallel as the upper face of slide is extra long and the slide and base are closely fitted. It can be employed with a sine bar for grinding angles, and also with gage blocks for building up work on a surface plate.

A feature of the planer is that the slot in which the slide travels is beveled as well as ground, the bevel preventing all side play when slide is tightened. This is accomplished by a clamp nut.

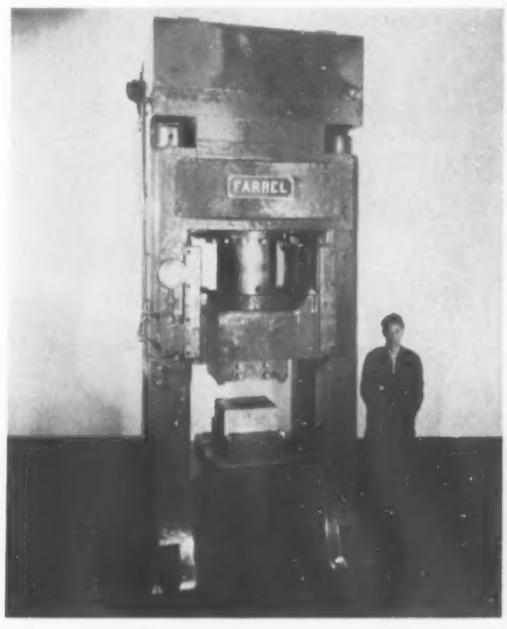
Gage can be used on base end or flat on either side as both slide and nut are within the outside width of the base and both sides are ground square with the working edges. Base and slide are of drop-forged steel and hardened. Base is ⅝ inches wide and 5⅛ inches long and fitted with a level.

Press Pump Is Located on Top

■ Farrel-Birmingham Co., Ansonia, Conn., has introduced a 300-ton, hydraulic press for forming, blanking and drawing metal. It is of the self-contained, individually-powered type with the motor-driven pump mounted on top of the press.

Capacity of the unit may be varied between 50 and 300 tons. It has one 18-inch main ram and two double-acting rams mounted in the top crosshead. Maximum working pressure is 2500 pounds per square inch supplied by a radial piston pump driven by a 20-horsepower motor. The down-stroke travels 241 inches per minute and the return stroke 321 inches per minute. The unit has a pressing speed of 12.7 inches per minute. The maximum opening of the press is 44 inches with a maximum stroke of 18 inches.

Crossheads and the frames between the top and bottom crossheads are made of Meehanite, a high strength, high tensile alloy metal. Tie rods are made of steel, and



Capacity of this Farrel hydraulic press is varied between 50 and 300 tons Maximum hydraulic pressure is 2500 pounds per square inch supplied by a radial piston pump driven by a 20-horsepower motor

the main cylinder is bronze lined. Moving crosshead guides are kept adjusted by movable bronze gibs sliding against the finished interior surfaces of the press side frames.

A foot pedal, located at the operator's left, controls the normal movements of the press. Constant depression of this pedal causes the moving crosshead to approach the work, engage it at the pre-set pressure and return to again repeat the cycle. If the operator removes his foot from the pedal, movement of the crosshead is stopped.

For die spotting, a hand-lever is attached at the face of the left side frame which causes slow movement or inching of the crosshead.

Full Vision with This Respirator

■ Mine Safety Appliances Co., Braddock, Thomas and Meade streets, Pittsburgh, has introduced a Dustfoe respirator weighing less than 3¼ ounces, and claimed to provide much comfort and protection.

Respirator allows full vision in any direction, does not interfere with the wearing of goggles, welding helmets or head coverings of any kind, and may be worn for long periods. All metal parts are made of aluminum, and may be sterilized at any time, including the soft rubber face-cushion.

Filter of the respirator will eliminate dust particles as small as one micron without hindering breathing.

Steel Balls Carry Swing Joint Loads

■ Chiksan Oil Tool Co., Ltd., Fullerton, Calif., has placed on the market a ball bearing, all-metal swing joint which is adaptable for all installations where movement is a factor.

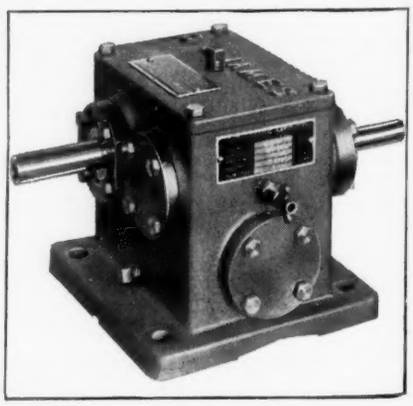
Double rows of hardened steel balls carry all radial loads and maintain a pre-regulated thrust load upon the packing element, keeping it always pressure tight and leakproof. Joint is so constructed that it can not bind nor in any manner be hindered from making a 360 degree swivel. Its smooth, streamlined exterior has no projections which may catch on workmen's clothes. Packing glands are eliminated and the joint is claimed to be unaffected by heat, cold and corrosive fluids.

These units are available in a wide variety of rotating actions, and constructed either of steel, malleable iron or aluminum. Sizes range from ¾ to 18 inches. They are available in threaded, flanged or plain ends for making connections on all kinds of pipe.

Wide Speed Range

■ D. O. James Mfg. Co., 1114 West Monroe street, Chicago, has introduced double worm gear reducers which have speed ratios ranging from 30 to 3600 to 1. Torque capacities of the reducers at the slow speed shaft are from 40-inch pounds to 400-inch pounds.

Reducers consist of two bronze worm gears and steel worms mounted on Timken tapered roller bearings in a small space. This results in a light drive with high ratios.



Speed ratios of illustrated D. O. James double worm gear reducer range from 30 to 3,600 to 1

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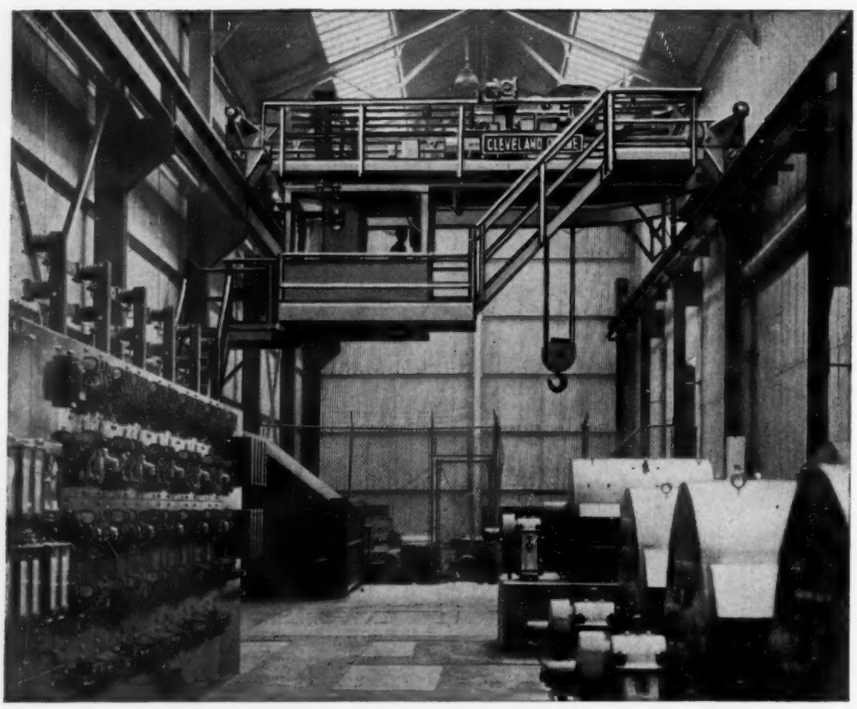

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MATERIALS HANDLING EQUIPMENT

Straightline Stamping

(*Concluded from Page* 50)

on which operates a 15-ton electric crane with a span of 60 feet. In this storage area more than 2600 active dies are stacked in neat rows, arranged so that they may be returned to the shop, when needed, with a minimum of effort and of delay.

All products of this plant are made of steel. With body parts stamping and many other items entailing large production runs, the scrap handling problem is one of large proportions, aggravated by the recent expansion. Scrap shipment should be in its correct relationship to other operations, which means that it should be at the most convenient point following production and at a location adjacent to point of shipment.

Has Railroad Sidings

The main plant building had been constructed in 1928. It is located on the main line of the Reading railroad with switch-tracks connecting directly with receiving and shipping departments. There are approximately 140,000 square feet of floor space in the main portion of this multi-story structure. Immediately in front of the main building is a concrete and steel highway bridge which crosses the railroad tracks. When this bridge was built, two tunnels were provided to furnish access to other company property across the street. It was here that the new building was erected, where the scrap handling and baling operations, as well as shipping, take place. The new building itself is a 1½-story structure with main floor and mezzanine. Switch-tracks from the railroad run down the length of the main floor and directly beneath a gravity roller conveyor on the mezzanine floor.

Before the rearrangement, scrap had been taken away from press stations in box-trucks and left to accumulate along shipping platforms at the far end of the main building. Sometimes, while awaiting carloading, it interfered with full usage of the loading platform. It also presented an unsightly appearance not in harmony with the remainder of the plant exterior. Incidentally, being loosely baled, it did not bring top price from scrap dealers.

At the present time, scrap is segregated in the press shop in two different trucks. One such classification is for stock for the salvage department. Out of such so-called "salvage" material, which is really high quality steel of sufficient dimensions to be worked upon, many small specialties are manufactured. Included in this category are roller skate wheels, screen door hinges, small automotive parts, bicycle seats, toasters and parts for electric irons.

Form Trailer Trains

Second in the classification is scrap to be sold. This is placed in special 4-wheel trailer-type trucks, equipped with steel box bodies of heavy-duty construction. By means of special coupling devices, three such trucks are joined and in turn are coupled to a gas-powered industrial tractor which pulls loads of scrap on the trailers from the press shop out across the plant yard and through the tunnel to the receiving door of the new scrap handling building. Here an operator uncouples the trucks, depositing them one after another on a steel platform of a special truck dumper located immediately inside the door of the building.

On a post located beside the dumper is a push-button controller where an operator controls the dumper which oscillates on a 90-degree angle. Scrap from the truck box drops onto a steel-apron elevating conveyor which transports the scrap from the dump station to the upper, or mezzanine, floor. The grade is approximately 30 per cent. At top of conveyor, scrap falls into an hydraulic baler. The lids are closed and the scrap is compressed into a tight unit, weighing from 300 to 400 pounds. Bales then are ejected automatically from the baler onto a gravity roller conveyor, which travels a path above the railroad tracks. At intervals along this conveyor are "drop stations," through which the bales fall into the gondola cars beneath. After one section of the car is filled, that conveyor station is closed and another opened over an empty portion of the car. Eventually, these openings will be connected with some sort of gravity chute to still further refine the handling system.

Tractor-trailer train with scrap arriving at unloading point. Truck dumper is located inside door immediately ahead of tractor. Portion of crane runway over outdoor scrap storage area may be seen

Controlled from Above

Operations of the conveyor are controlled from the upper floor, where a similar controller to that for the dumper is located. Operator at the baler has knowledge of loading conditions at all times, whereas the operator at the dumper might fall easily into the error of allowing too much scrap to run up and over the

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Preformed
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Locked Coil
Regular Lay
Lang's Lay
Hemp Center
Wire Rope Center
Metallic Core
Seale - Filler Wire
Warrington

couples the trucks and returns them to the press shop for another load. Truck bodies contain 56 cubic feet of space. The scrap conveyor is 56 inches wide and is drawn by a 5-horsepower motor located in the pit beneath the conveyor loading station.

In addition to these facilities, there also is provision for storage and handling of excess scrap in rush periods. To the west of the new building and running its entire length is a scrap storage yard serviced throughout by an electric overhead crane operating on a steel runway. Control for this crane, which is equipped with magnet, is located conveniently on a post at one end of the yard. It is a push-button unit, the operator standing on the ground alongside the controller post, and guiding movements of crane and magnet.

Except for the space occupied by dumper and conveyor, remainder of the new building is utilized for production of specialties, for storage of dies used in this department and for storage of by-products materials.

Presses, like those in the main press shop, are arranged in straight-line groups in such a manner that they can be grouped either for long production runs on a single product, or used singly or in combinations for other products, providing flexibility. Parts from these presses, as in the main press shop, are dropped into corrugated steel skid boxes which are moved to and from the presses by five battery-powered electric lift trucks. Batteries are recharged and serviced in the electrical repair department at the main building.

Die storage in the specialties department is interesting. Twin steel storage racks have been constructed in one corner of the first floor just beyond the last press station. An 8-ton crane has been installed to handle dies into and out of these storage racks.

Operation Made Easier

In order to make the operation easier, a movable platform on rollers has been provided between the twin racks which extend almost to the ceiling so as to utilize air rights to the full and conserve valuable floor space. There is ample provision for all dies normally required, yet a minimum of plant floor space is taken from productive use.

Salvage scrap is stored in bins on one side of the press room. This is classified carefully and segregated according to such classes. Bins are clearly marked, showing the gages of the steel as well as other identifications.

While the foregoing is only a brief and very sketchy description of an unusually fine job, it is indicative of a renewed dependence upon efficient methods. While this company has placed considerable reliance in the past upon sound materials handling methods, it now has secured better co-ordination than ever throughout its entire plant operations.

High Production Of Speed Nuts

(*Concluded from Page* 47)

seen at right in Fig. 4. These coils are placed on floor-mounted reels feeding the forming machines. Formed nuts fall into sheet metal tote boxes which are moved on dollies to the degreaser and shipping department or to the heat treating department.

In certain types of nuts it is desirable to have outside corners and edges rounded off to prevent scratching surfaces on which they are applied. Several small tumbling barrels are used for this work. One of these is seen in the background in Fig. 3.

Die practice in this plant is interesting in that the progressive dies are not made up until samples of a design have been tested and found satisfactory by the user. These samples, which often run into the thousands, are made on a series of 18 small foot presses and forming machines in the development laboratory. After samples are approved, dimensions and die specifications are already at hand so they can be given to the die department and the complicated progressive dies made to put that design into mass production.

When the progressive dies have been made, production is started at comparatively low speed and the variable speed drive adjusted gradually to speed up the work until a point is reached where maximum production with the required quality is obtained.

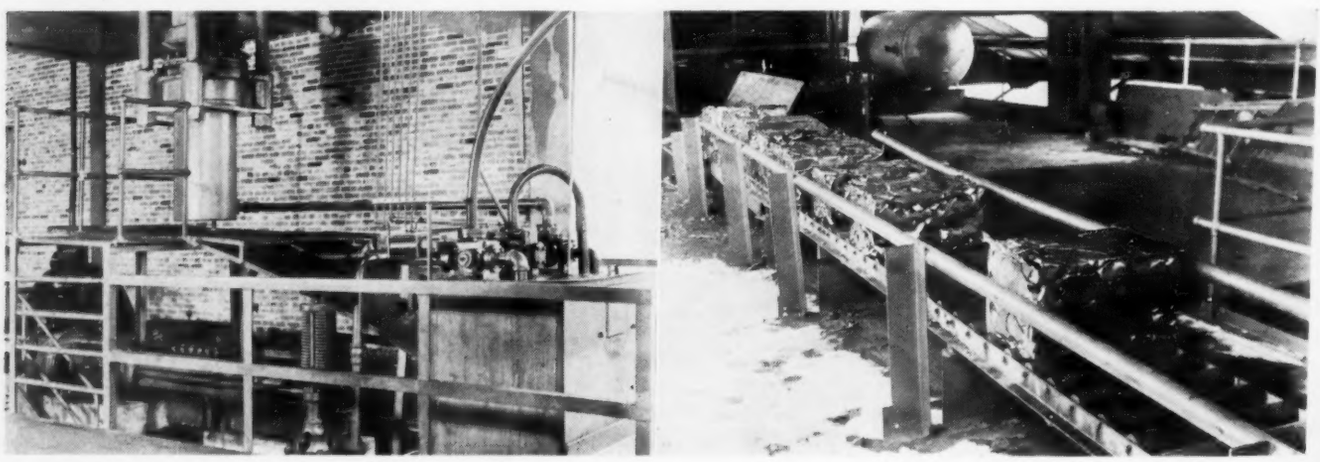
♦

Sound Film Dramatizes Steel

■ A sound film entitled "Romance of Iron and Steel," dramatizing the story of the manufacture of sheet iron and steel from iron ore to the finished product was recently released by American Rolling Mill Co., Middletown, O.

The film conveys a striking picture of the progress of human beings in contrasting the methods of primitive man and those of the present day in extracting iron from ore. It emphasizes the part the research laboratory has taken in the manufacture of steel sheets and displays important processes of converting the ore into the final product.

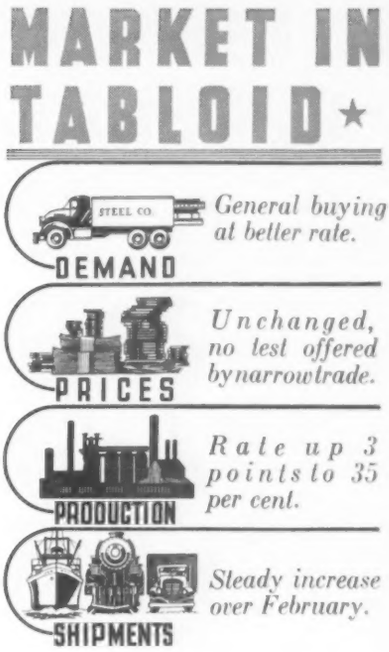
According to the company, the film is available to Armco customers, distributors, engineers, architects, industrial clubs, purchasing agents and sales organizations.



Close-up (left) of the hydraulic baler which compresses the scrap. Roller conveyor (right) transporting baled scrap by gravity to "drop stations" through which it falls directly into gondola cars below

Better Buying Reflected in Larger Steel Output

General Demand Is Moving Upward; Lag In Some Lines



■ GENERAL demand for steel is making a steady advance, though at a slow rate, consumers in a wide variety of channels increasing their commitments as inventory becomes exhausted.

Failure of two important industries, automotive and railroad, to take any considerable part of their ordinary tonnages is a severe handicap to the upward movement usual at this season.

Manufacturers of stoves, refrigerators, air conditioning equipment and agricultural implements are carrying forward programs of sufficient importance to require larger steel supplies. Miscellaneous products for farm use are moving well, as agricultural prospects are excellent.

Some large structural tonnages are coming out, backed by a gratifying background of smaller projects. Bids will be asked within a few days on 10,000 tons of structural steel for the Main avenue bridge, Cleveland. Prices have been asked on 16,855 tons for the Delaware aqueduct, New York, and on 3650 tons for buildings at Penn State college, Pennsylvania. Steel has been awarded for the Flushing river bridge, New York, 1200 tons.

With increased operations at seven steelmaking centers and only one decline the national operating rate last week rose 3 points to 35 per cent, the level predicted for the end of March. This is the highest rate since the week of Nov. 20. At Chicago the advance was 1.5 points to 31.5 per cent, Wheeling 3 points to 41, Buffalo 2 points to 30, Birmingham 5 points to 66, New England 3 points to 18, Cincinnati 20 points to 45 and Youngstown 2 points to 29. Detroit dropped 5 points to 27 per cent. There was no change in activity at Pittsburgh 30 per cent, Eastern Pennsylvania 29, Cleveland 30.8 and St. Louis 37.

World steel needs are reflected in the sustained rate of exports, Japan and the United Kingdom leading in tonnage. February exports were slightly lower than in January, due to the shorter month, but for January and February were 61.5 per cent larger than a year ago. Pig iron shipments were 54,332 tons in February and steel ingot exports 29,497 tons. Movement of scrap totaled 256,790 tons with 613,327 tons for the first two months, an increase of 173 per cent over the same period a year ago.

With a record tonnage of iron ore on docks and at furnaces, estimated at 33,000,000 tons for May 1, movement of the ore fleet on the Great Lakes will start late and tonnage transported will be much smaller than last year. Estimates vary but center around 25,000,000 to 30,000,000 tons, which is less than half the 1937 shipments. Nothing has been done as to price and no inquiries for the coming season are current.

Some railroad needs are breaking through the resistance caused by diminished income and orders for cars, locomotives and rails are being placed in a small way. Chicago Great Western has bought 4175 tons of rails and 3040 tons of fastenings. The New Haven has bought ten diesel-electric locomotives and the Rock Island has leased an equal number. Canadian Pacific has awarded to builders in the Dominion 2800 freight cars and 25 locomotives.

Automobile production is steady, last week showing a total of 56,800 units, compared with 57,555 the preceding week. General Motors produced 23,160 compared with 23,860 the week before; Ford 12,060 against 12,560; Chrysler 12,225 against 12,975 and others 9335 against 8160.

While steelmaking scrap is largely nominal and buying is of unimportant volume occasional signs indicate melters are not all possessed of sufficient reserves. Last week purchases were made of lots of 2000 tons in the St. Louis, Buffalo and Eastern Pennsylvania districts. Export buying is light at the moment and prices are steady.

Due to an adjustment in nominal quotations the composite price of steelmaking scrap last week declined 4 cents, to $13.21, balancing the rise of the preceding week. The iron and steel composite declined 3 cents, to $38.75. No change was made in the finished steel composite at $61.70.

COMPOSITE MARKET AVERAGES

	Mar. 26	Mar. 19	Mar. 12	One Month Ago Feb., 1938	Three Months Ago Dec., 1937	One Year Ago Mar., 1937	Five Years Ago Mar., 1933
Iron and Steel	$38.75	$38.78	$38.83	$38.90	$38.88	$39.92	$27.92
Finished Steel	61.70	61.70	61.70	61.70	61.70	60.70	45.60
Steelworks Scrap..	13.21	13.25	13.21	13.54	13.24	20.95	6.47

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	March 26, 1938	Feb. 1938	Dec. 1937	March 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.40c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.75	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.20
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.20
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.35
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.10
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.70
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.45
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.85
Plain wire, Pittsburgh	2.90	2.90	2.90	2.85
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.70

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$36.40
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	36.40
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	36.40
Wire rods, No. 5 to 9/32-inch, Pitts.	47.00	47.00	47.00	46.20

Pig Iron

	March 26, 1938	Feb. 1938	Dec. 1937	March 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$24.85
Basic, Valley	23.50	23.50	23.50	23.10
Basic, eastern del. East. Pa.	25.34	25.34	25.34	24.76
No. 2 fdry., Pittsburgh	25.21	25.21	25.21	24.80
No. 2 fdry., Chicago	24.00	24.00	24.00	23.20
Southern No. 2, Birmingham	20.38	20.38	20.38	19.88
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.19
No. 2X eastern, del. Phila.	26.215	26.215	26.215	25.635
Malleable, Valley	24.00	24.00	24.00	23.60
Malleable, Chicago	24.00	24.00	24.00	23.20
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.24	28.95
Gray forge, del. Pittsburgh	24.17	24.17	24.17	23.75
Ferromanganese, del. Pittsburgh	107.49	107.49	107.49	90.80

Scrap

Heavy melting steel, Pittsburgh	$13.50	$14.15	$13.40	$22.40
Heavy melt. steel, No. 2, E. Pa.	13.00	13.25	13.13	18.75
Heavy melting steel, Chicago	12.25	12.15	12.40	20.90
Rails for rolling, Chicago	15.25	15.25	14.25	22.25
Railroad steel specialties, Chicago	14.25	14.85	15.75	22.35

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.30	$4.05
Connellsville, foundry, ovens	5.25	5.25	5.25	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	10.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.21c
Philadelphia, del.	3.30c
New York, del.	3.34c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars	3.62½c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.66c
Philadelphia, del.	3.75c
New York, del.	3.79c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, f.o.b. cars	2.82½c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c
Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/4-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality.	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.:	
½ to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 9/32-inch incl.	47.00
Do., over 9/32 to 11/32-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.63

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethelehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	23.30	.....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent	126.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.95-2.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f.o.b. mill	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York: Spot	Straits Tin, New York: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Mar. 19	10.00	10.12½	9.52½	41.50	41.65	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 21	10.00	10.12½	9.52½	41.50	41.62½	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 22	10.00	10.12½	9.52½	41.35	41.50	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 23	10.00	10.12½	9.52½	41.10	41.20	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 24	10.00	10.12½	9.52½	41.25	41.40	4.50	4.35	4.25	20.00	13.75	35.00
Mar. 25	10.00	10.12½	9.52½	41.20	41.30	4.50	4.35	4.25	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c *Conn. copper*

Sheets

Yellow brass (high)	16.37½
Copper, hot rolled	18.12½
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	10.00

Tubes

High, yellow brass	19.12½
Seamless copper	18.62½

Rods

High yellow brass	12.37½
Copper, hot rolled	14.62½

Anodes

Copper, untrimmed	15.37½

Wire

Yellow brass (high)	16.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York	5.65-5.90
*Cleveland	6.50-6.75
*Chicago	5.62½-5.87½
St. Louis	5.50-5.75

Heavy Copper and Wire

*New York, No. 1	6.62½-6.87½
Cleveland, No. 1	7.25-7.50
*Chicago, No. 1	7.25-7.50
St. Louis	7.00-7.50

Composition Brass Borings

*New York	4.65-4.90

Light Copper

*New York	4.62½-4.87½
*Cleveland	5.75-6.00
*Chicago	5.37½-5.62½
St. Louis	5.00-5.25

Light Brass

*Cleveland	3.25-3.50
*Chicago	3.50-3.75
St. Louis	3.50-4.00

Lead

New York	3.50-3.75
*Cleveland	3.25-3.50
Chicago	3.00-3.25
St. Louis	2.37½-2.62½

Zinc

New York	1.87½-2.00
Cleveland	1.75-2.00
*St. Louis	1.87½-2.00

Aluminum

*Borings, Cleveland	5.25-5.50
*Mixed cast, Cleve.	8.25-8.50
*Clips, soft, Cleve.	11.75-12.00
Mixed cast, St. L.	8.50-8.75

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl	10.25
*Stand. No. 12 alum.	15.75-16.25

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.20c	4.40c	5.40c	4.08c	4.07c	5.73c	4.15c	4.90c	5.10c
New York (Metropolitan)	4.12	4.32	4.32	4.00	3.97	5.60	4.07	4.50	5.00
Philadelphia	4.00	4.10	4.35	3.90	3.90	5.25	4.00	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.15	4.35	4.60	4.05	4.05	5.65	4.10	4.70	5.35
Buffalo	3.90	4.22	4.22	3.92	3.80	5.52	3.97	4.80	5.35
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.16	4.16	3.86	3.86	5.46	3.91	4.66	5.31
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.05	4.25	4.25	3.95	3.95	5.55	4.00	4.75	5.40
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.25
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.09	4.34	4.34	3.99	3.99	5.59	4.09	4.84	5.49
Kansas City	4.34	4.59	4.59	4.24	4.24	5.84	4.10	4.85	5.50
Memphis	4.31	4.51	4.51	4.21	4.21	5.85	4.26	5.01	5.66
Chattanooga	4.21	4.41	4.41	4.11	4.11	5.91	4.16	4.06	4.66
Tulsa, Okla.	4.79	5.04	5.04	4.69	4.69	6.29	4.79	5.54	6.19
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	5.96	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.845c	4.65c	4.50c	7.97c	6.52c	6.27c	8.37c	8.97c	7.52c
New York	3.92	4.57	4.32	7.82	6.37	6.12	9.52	9.00	7.55
Philadelphia	3.88	4.53	4.25	....	....	....	9.49	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.79	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.50	4.07	7.91	6.46	6.21	9.31	8.92	7.47
Chicago	3.87	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.77	4.25	7.95	6.50	8.97	9.57	9.17	7.72
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	3.96	4.54	4.29	7.94	6.49	6.24	8.34	8.94	7.49
Kansas City	4.37	4.79	....	....	....	....	....	....	....
Memphis	....	4.80	....	....	....	....	....	....	....
Chattanooga	....	4.86	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.24	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, March 24

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$28.58 5 15 0	$18.09	2 5 0
Basic bessemer	....	.....	.....
Hematite, Phos. .03-.05	32.31 6 10 0*	17.89	2 4 6
Billets	$39.14 7 17 6	$43.22	5 7 6
Wire rods, No. 5 gage	56.04 11 5 6	40.20	5 0 0
Standard rails	$50.32 10 2 6	$46.23	5 15 0
Merchant bars	2.61c 11 15 0	1.90c	5 5 0
Structural shapes	2.36c 10 12 6	1.77c	4 17 6
Plates, †¼ in. or 5 mm.	2.57c 11 11 3	2.23c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.11c 14 0 0	2.82c	7 15 0°
Sheets, gal., 24 ga., corr.	3.72c 16 15 0	3.45c	9 10 0
Bands and strips	2.94c 13 5 0	1.82c	5 0 0
Plain wire, base	4.33c 19 10 0	2.23c to 2.64c	6 2 6 to 7 5 0
Galvanized wire, base	5.16c 23 5 0	2.85c to 2.95c	7 17 6 to 8 2 6
Wire nails, base	4.11c 18 10 0	2.54c to 2.72c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.59 1 2 6	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$27.09	5 9 0(a)	$17.24	563.50	$21.91	650	$25.26	63
Basic bess. pig iron	24.85	5 0 0(a)	.....	.....	.....	.....	27.88 (b)	69.50
Furnace coke	8.08	1 12 6	5.78	189	7.25	215	7.62	19
Billets	39.14	7 17 6	25.70	840	32.35	960	38.71	96.50
Standard rails	2.25c	10 2 6	1.61c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.54c	11 9 0	1.51c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.45c	11 0 6	1.48c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.60c	11 14 3	1.89c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.50c	15 15 0§	2.19c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.11c	18 10 0	3.15c	2,250	4.50c	3,000	6.66c	370
Plain wire	4.33c	19 10 0	2.32c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.71c	12 4 0	1.69c	1,210	2.32c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed.

**Gold pound sterling carries a premium of 65.2 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Birmingham, No. 2	9.00
Bos. dock No. 1 exp.	13.00
N. Eng. del. No. 1	12.50
Buffalo, No. 1	12.50-13.00
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.25-12.50
Cleveland, No. 1	11.00-11.50
Cleveland, No. 2	10.00-10.50
Detroit, No. 1	7.50- 8.00
Eastern Pa., No. 1	14.00-15.00
Eastern Pa., No. 2	12.00-13.50
Federal, Ill.	11.00-11.50
Granite City, R. R.	11.75-12.25
Granite City, No. 2	10.75-11.25
Los Angeles, No. 1	13.50-14.00
Los Angeles, No. 2	12.00-12.50
New York, No. 1	†11.00
N. Y. dock No. 1 exp.	12.50
Pitts., No. 1 (R. R.)	14.25-15.25
Pitts., No. 1 (dlr.)	13.25-13.75
Pittsburgh, No. 2	12.50-13.00
St. Louis, R. R.	11.75-12.25
St. Louis, No. 2	10.75-11.25
San Francisco, No. 1	10.00
Seattle, No. 1	8.00
Toronto, dlrs. No. 1	10.00
Valleys, No. 1	13.25-13.75

COMPRESSED SHEETS

Buffalo, dealers	10.50-12.00
Chicago, factory	10.75-11.25
Chicago, dealer	10.00-10.50
Cleveland	10.50-11.00
Detroit	9.00- 9.50
E. Pa., new mat.	14.00-15.00
E. Pa., old mat.	9.50-10.00
Los Angeles	12.50-13.00
Pittsburgh	13.25-13.75
St. Louis	6.75- 7.25
Valleys	12.00-12.50

BUNDLED SHEETS

Buffalo	11.50
Cincinnati, del.	8.50- 9.00
Cleveland	7.50- 8.00
Los Angeles	11.00-11.50
Pittsburgh	12.00-12.50
St. Louis	6.00- 6.50
Toronto, dealers	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.25- 7.75
Cincinnati	5.00- 5.50
Detroit	5.50- 6.00
†Los Angeles	3.75- 4.00
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.50-18.00
Chicago (3 ft.)	14.50-15.00
Chicago (2 ft.)	15.00-15.50
Cincinnati, del.	16.50-17.00
Detroit	13.50-14.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	17.50-18.00
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	12.00-12.50
Cleveland	16.00-16.50
Pittsburgh	15.25-15.75
St. Louis	12.00-12.50
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	10.50-11.00
Chicago, net	8.00- 8.50
Cincinnati, dealers	6.50- 7.00
Detroit, net	7.50- 8.00
Eastern Pa.	12.50-13.00
New York, fdry.	†8.00- 8.50
St. Louis	7.50- 8.00
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.00-16.50
Chicago, leaf	14.50-15.00
Eastern Pa.	17.00-17.50
Pittsburgh	17.50-18.00
St. Louis	14.50-15.00

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	12.50-13.00

RAILROAD SPECIALTIES

Chicago	14.00-14.50

LOW PHOSPHORUS

Buffalo, crops	17.00-17.50
Cleveland, crops	19.50-20.50
Eastern Pa., crops	18.50-19.00
Pittsburgh, crops	17.50-18.50

FROGS, SWITCHES

Chicago	12.00-12.50
St. Louis, cut	12.00-12.50

SHOVELING STEEL

Federal, Ill.	10.75-11.25
Granite City, Ill.	10.75-11.75
Los Angeles	15.00-16.50
Toronto, dealers	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	9.00- 9.50
Cincinnati, No. 2	9.00- 9.50
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	8.25- 8.75
St. Louis, No. 2	11.75-12.25
Toronto, No. 1 dlr.	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.50-11.00
Cincin., No. 1, deal.	7.50- 8.00
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1, new	7.50- 8.00
Valleys, new, No. 1	12.00-12.50
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	6.25- 6.75
Chicago	6.00- 6.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.00- 4.50
Eastern Pa.	7.00- 7.25
Los Angeles	4.00- 4.25
New York	†3.50
Pittsburgh	7.00- 7.50
St. Louis	4.50- 5.00
Toronto, dealers	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†1.85
Buffalo	6.50- 7.00
Cincinnati, dealers	3.00- 3.50
Cleveland	7.50- 8.00
Detroit	4.50- 5.00
Eastern Pa.	6.50- 7.00
New York	†3.50- 4.00
Pittsburgh	6.00- 6.50
Toronto, dealers	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†6.00- 6.50
Bos. dist. for mills	†6.50
Buffalo	6.50- 7.00
Chicago	5.25- 5.75
Cincinnati, dealers	3.00- 3.50
Cleveland	7.50- 8.00
Detroit	4.50- 5.00
E. Pa., chemical	12.00-13.00
New York	†4.00- 4.50
St. Louis	5.00- 5.50
Toronto, dealers	7.50

PIPE AND FLUES

Cincinnati, dealers	6.50- 7.00
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	7.50- 8.00
Cincinnati	6.00- 6.50
Eastern Pa.	12.50-13.00
New York	†8.00- 8.50
St. Louis	8.00- 8.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	10.50-11.00
Cleveland	11.00- 11.50
Detroit	7.00- 7.50
Los Angeles	9.00
Pittsburgh	12.00-12.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	14.50-15.00

ARCH BARS, TRANSOMS

St. Louis	13.00-13.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.00-12.50
Chicago, elec. fur.	11.00-11.50
Eastern Pa.	12.50-13.00
St. Louis	8.50- 9.00
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.00-16.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	21.50-22.50
St. Louis	17.50-18.00

SHAFTING

Boston district	†14.00
New York	†15.00-15.50
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	13.50-14.00
Chicago, rolled steel	14.50-15.00
Cincinnati, iron	14.00-14.50
Eastern Pa., iron	15.50
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	17.50-18.00
St. Louis, iron	11.50-12.00
St. Louis, steel	14.50-15.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2	12.00
N. Eng. del. textile	15.00-15.50
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net	11.50-12.00
Cincin., mach. cup.	10.50-11.00
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	15.50-16.00
E. Pa., mixed yard	13.50-14.00
Los Angeles, net	13.50-14.00
Pittsburgh cupola	15.50-16.00
San Francisco, del.	13.50-14.00
Seattle	8.00
St. Louis, No. 1	10.00-10.50
St. L., No. 1, mach.	12.00-12.50
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break.	†9.00- 9.50
N. Eng., del.	11.50-12.00
Buffalo, break	11.00-11.50
Cleveland, break.	14.00-15.00
Detroit, break.	10.50-11.00
Detroit, auto net	12.00-12.50
Eastern Pa.	14.00-14.50
Los Ang., auto, net	13.00-13.50
New York, break.	†10.50-11.00
Pittsburgh, break.	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	13.50-14.00
Chicago, R. R.	14.00-14.50
Cincin., agri. del.	10.00-10.50
Cleveland, rail	15.50-16.00
Detroit, auto	11.00-11.50
Eastern Pa., R. R.	15.50-16.00
Los Angeles	17.50-18.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	12.50-13.00

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	13.50-14.00

LOCOMOTIVE TIRES

Chicago (cut)	14.50-15.00
St. Louis, No. 1	13.75-14.25

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	14.00-14.50
Eastern Pa.	18.00-19.00
Pitts. (lt. & hvy.)	17.00-18.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% non.	45.00
So. African, 50-52% nom.	45.00
Indian, 50-52%	Nominal

—The Market Week—

Sheets

Sheet Prices, Page 70

Chicago — Recent gains in sheet business have been accounted for principally by heavier requirements of refrigerator, stove and range interests and miscellaneous consumers. Automotive buying still drags and sheet producers are none too hopeful of upturn in shipments to motor car interests during the next several weeks. Mills have no backlogs and early delivery is available.

Pittsburgh — Sheet production is up slightly, in both common and galvanized divisions. Automotive sources believe a late introduction of 1939 models is being planned. If this is true, automotive sheet users will probably hold off buying until late summer, probably the latter part of August.

Cleveland — Specifications for hot and cold-rolled sheets from local stamping concerns and other miscellaneous users have shown moderate improvement, but buying represents only actual needs. Consumers' inventories with the exception of auto partsmakers and suppliers are low.

New York — With small miscellaneous building more active galvanized sheets are moving in the best volume this year. This movement is also being stimulated by releases from manufacturers of air condition equipment, who, relatively, are perhaps the most active buyers of sheets in the district. Enameled sheets reflect more active buying by manufacturers of refrigerators, stoves, washing machines and other household equipment.

Philadelphia — Galvanized sheets are moving most actively of all light, flat rolled items. This reflects not only improved specifications for miscellaneous building construction, but expanding requirements of manufacturers of air-conditioning equipment. Relatively, demands from this group of manufacturers have made the best gains this spring. Commercial refrigerator manufacturers are buying a fairly substantial amount of steel, including enameled stock and stainless strip. Apart from one company which has only recently gone into production following suspension due to labor troubles, district stove makers are specifying lightly. Radio requirements are slightly improved but disappointing to sellers generally.

Edward G. Budd Mfg. Co. has placed a fairly large tonnage of sheets for Studebaker automobile bodies.

Buffalo—Buying of sheets is light with specifications for March show-

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HEATING engineers, plant supervisors, and furnace builders will welcome this new booklet which describes the uses and physical characteristics of Armstrong's COPRTEX High Temperature Block and Heat Insulating Cement. In its pages you will find information on how to increase the efficiency of your heated equipment, lower fuel costs, and obtain more accurate temperature control.

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ing no increase from the light volume of February. Failure of automotive orders to develop is reflected in laggard demand from stamping and forging concerns.

Cincinnati — Demand for sheets creeps upward so that tonnage this month is certain to be greater than in February. Some improvement is shown in releases for household equipment but this does not meet seasonal expectations. Production schedules fluctuate widely, ingot output by one interest last week being 50 per cent, considerably above level of orders. Galvanized sheets continue to loom large in bookings.

Boston—Contracts for 1002 tons of hot-rolled pickled annealed sheets for three states, license tag stock, features a rather listless demand for flat-rolled steel. Avery & Saul Co., South Boston, took 750 tons. No. 23 gage for Massachusetts at 3.71c, delivered Charlestown state prison, Boston. L. E. Zurbach Steel Co., Cambridge, was awarded 102 tons, same gage, for New Hampshire, Concord delivery, at 3.75c. Low bidder on 150 tons, No. 24 gage, delivery Thomaston, Me., did not get the contract which went to Bancroft & Martin Rolling Mills, Portland, Me. at 3.86c, less one-half of one per cent, 10 days. Bethlehem Steel Co., Bethlehem, Pa., will supply sheets for the Maine order. This will be shipped after the new freight rates become effective. Industrial demand for sheets is slow, notably from stamping shops and small-tank fabricators, although some gain from miscellaneous sources through jobbers is maintained.

St. Louis—Gradual improvement noted in the sheet situation during the past several weeks continues at slightly accelerated pace. Orders continue for the most part small individually, a notable exception being the sale of 2000 tons to a container manufacturer for second quarter delivery. Air conditioning, refrigerator, stove and metal furniture manufacturers are accounting for fair tonnages.

Birmingham, Ala. — Sheets maintain approximately the pace of the past few weeks. Some worthwhile specifications have been received, but most business is in relatively small lots. A slight increase in demand for roofing is noted.

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Strip

Strip Prices, Page 71

Cleveland — Specifications for wide or narrow strip from auto partsmakers has failed to register improvement. However, most sellers feel that sales this month will show an increase of about 10 per cent over February.

Pittsburgh—Strip production, still lagging, showed a slight increase in cold-rolled. Hot-rolled production continues at the same pace. Production still suffers from lack of automotive orders. Purchasers undoubtedly are buying only on a hand to mouth basis for immediate needs although stocks generally are believed to be low.

Chicago—Strip demand is receiving better support from miscellaneous consumers, whose low inventories necessitate additional buying. Absence of heavier demand from the automotive industry is a retarding factor and gains in total shipments for the past few weeks have been only moderate. Orders continue small individually.

Philadelphia—Narrow strip business here shows some improvement. Hardware manufacturers are specifying a little more freely and there is some expansion in other lines including radio requirements. However, the market is far from brisk.

Boston—The character of narrow

cold strip buying is unchanged with little improvement in volume. Orders continue diversified, but small, for prompt shipment to fill gaps in spots which appear from time to time. Consumer operations are slow as a rule. The situation with many users of strip revolves around slowness in which finished parts are being liquidated. Regardless of the condition of steel stocks, buyers are striving to move these parts before taking in strip beyond immediate needs. Cold strip operations vary from day to day, but do not average much better than 30 per cent. Hot strip buying is spotty and light with re-rollers' stocks ample for present operations except in scattered sizes.

Plates

Plate Prices, Page 70

Philadelphia — A slight increase is noted in plate buying but demand is still decidedly spotty. Ship tonnage is developing slowly and the two principal railroads in this district show no interest. The Pennsylvania, scheduled earlier in the year to wind up its program of new car construction March 1, for which steel has long been bought, has still some of this construction to work off.

The Reading, now said to be operating at a loss for the first time in many years, holds out little encouragement to steel sellers. It has 300 automobile cars still to build in its own shops out of a total of 600, but it has long since been fully covered on its steel requirements for this program.

Local bidders were high on the two 110-foot coastguard cutters, on which bids were opened last week and which will require 135 tons of hull steel each. The low bidder, it appears, is the Marine Utilities division of Midland Utilities Inc., Whitestone, N. Y. United Engineers & Constructors, Philadelphia, are expected to place a contract shortly for the 2,000,000-cubic foot gas tank to be erected for a utility company in Waterbury, Conn. This tank will require approximately 1400 tons.

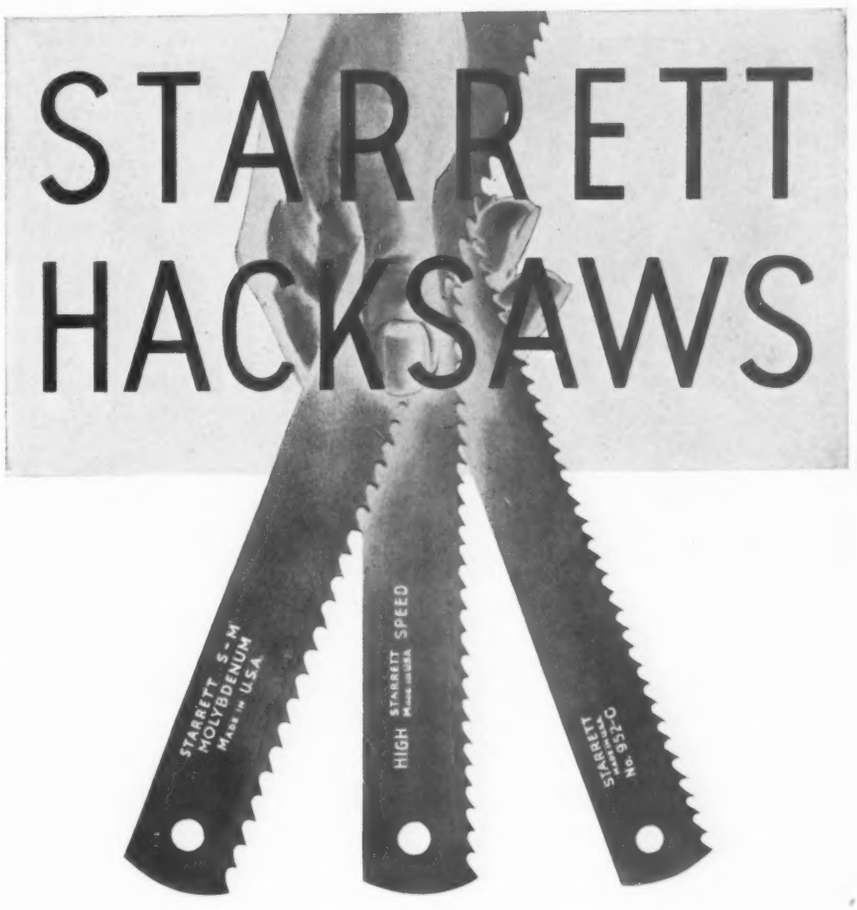
Pittsburgh — Incoming railroad specifications have proved disappointing to platemakers as some tonnage was expected as a result of the rate increase. Structural plate orders are somewhat better, with inquiries more numerous, and plans for new projects give some indication that an increased tonnage will be booked in succeeding months.

Chicago—Plate demand is slightly heavier from fabricators and miscellaneous users. Railroads are taking only small lots for equipment repairs and what material is being shipped for new freight car building represents tonnages to complete programs inaugurated some time ago. The absence of new inquiries for rolling stock points to little prospect of an early pickup in plate demand for railroad use.

Cleveland — Sellers of wide and narrow plates note only slight improvement in orders for only actual requirements and prompt delivery. Railroad buying continues dormant. Prices are unchanged.

New York—The plate market appears to have lost the slight bulge of a week or so ago. Except for the Delaware aqueduct on which bids were just opened little pending domestic tonnage is active. Export demand is also easier, although Japan is inquiring for 10,000 to 12,000 tons of plates and miscellaneous items. Export prices are generally unchanged except for slight reductions under cartel schedules on shipments to Cuba, South and Central America.

Boston—Plate orders for small lots are maintained, but the aggregate tonnage is light and car-lot re-



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leases few. Most larger tonnage consumers are operating on curtailed schedules with a lack of specified work. Industrial demand is slack, although shipyard releases in car lots are made from time to time.

Seattle — No large tonnages are up for figures but small projects are in fair volume, shops reporting normal spring inquiry. Commercial Boiler Works and Nelson Boiler & Tank Works, Seattle, have contracts to build two allwelded steel river oil barges, involving about 65 tons. Junction City, Oreg., received bids March 21 for a storage tank and tower, capacity 100,000 gallons.

San Francisco—City of Seattle has just passed an ordinance rescinding an award for 1800 tons of welded steel pipe and 1300 tons of cast iron pipe for a crosstown pipe line to Puget Sound Machinery Depot and is expected to call for new bids. So far this year 13,561 tons have been booked as compared with 20,817 tons for the corresponding period in 1937.

Birmingham, Ala. — Plate bookings are on a moderate basis, approximating the rate since the first of the year. Some increase, however, in current bookings is expected, with scheduled awarding at an early date of approximately 6000 tons for fabrication locally for Inland Waterways Corp. barges.

Plate Contracts Placed

1200 tons, mostly plates, gas-holder, Connecticut Light & Power Co., Waterbury, Conn., to unstated fabricator, through United Engineers & Constructors Inc., Philadelphia.

Unstated tonnage, 150,000-gallon tank, Colonial Beacon Oil Co., Gloucester, Mass., to Hammond Iron Works, Warren, Pa.

Plate Contracts Pending

1800 tons, 20 to 36-inch welded steel pipe, Seattle; contract awarded to Puget Sound Machinery Depot, Seattle, has been rescinded and new bids will be taken.

150 tons, in addition to 75 tons shapes, two welded steel barges for United States engineer office, San Francisco; Boiler Tank & Pipe Co., Oakland, Calif., low.

Unstated tonnage, two steel-hull maneuver boats and two needle barges, U. S. engineer, Chicago; Calumet Shipyard & Drydock Co., Chicago, low, $80,500, bids March 16; barges, $75,542, delivery 180 days, Peoria lock-dam and La Grange lock-dam; spec. 1088-38-84.

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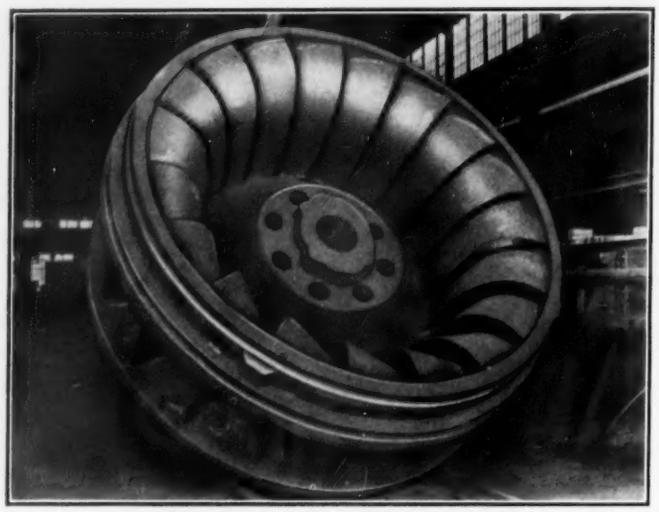

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Bars

Bar Prices, Page 70

Chicago — Miscellaneous consumers furnish most current gains in bar sales though requirements of farm equipment manufacturers are steady and remain outstanding. Business from automotive interests continues disappointing and has shown but little change in several weeks. Curtailment of users' inventories accounts for a large share of recent betterment in shipments.

Boston—Forging shop operations in several instances are higher, notably those producing marine hardware, reflected in moderately better demand for forging bars. While in small lots, alloy and cold-finished bar demand is steady, although slow demand from textile machinery builders has kept down the aggregate volume of the latter. Merchant steel bar demand continues to lag, with jobbers buying only to fill gaps.

For the Boston navy yard, bids close April 8 on 105 tons of nickel steel bar stock for chainmaking, schedule 3155, bureau of supplies and accounts.

Philadelphia — Bar specifications show further lift, particularly in cold-drawn and alloy lines. Government inquiry is reflected in this improvement, with continued brisk demand from the airplane industry and for machinery for export. March 28 new freight rate schedules on in-

terstate hauls become effective on less than carlots of steel, with similar changes in intrastate movements, which include the all-important movements from Pittsburgh, Bethlehem and Coatesville to this city, likely to become effective also. The advance in interstate shipments of carlots becomes effective April 11, with indications pointing to a corresponding change in intrastate shipments as well by that time.

Pittsburgh—Bar orders continue to come from a widely diversified field. Some slight increases in inquiries and orders have been noted but not in large enough quantities to have definite meaning.

Cleveland — Producers report operations at relatively low levels as specifications continue to represent only actual needs of consumers. Demand from auto suppliers continues light. Farm equipment manufacturers are comparatively busy. Prices remain firm.

Buffalo—A moderate expansion of a diversified character is noted in demand for bars. Inquiry is mainly from structural, agricultural and general manufacturing sources. Buying indicates inventories of consumers are practically depleted. Anticipated automotive buying has not appeared.

Birmingham, Ala. — Spotty improvement in demand for bars is noted, much materializing from agricultural implement manufacturers.

Pipe

Pipe Prices, Page 71

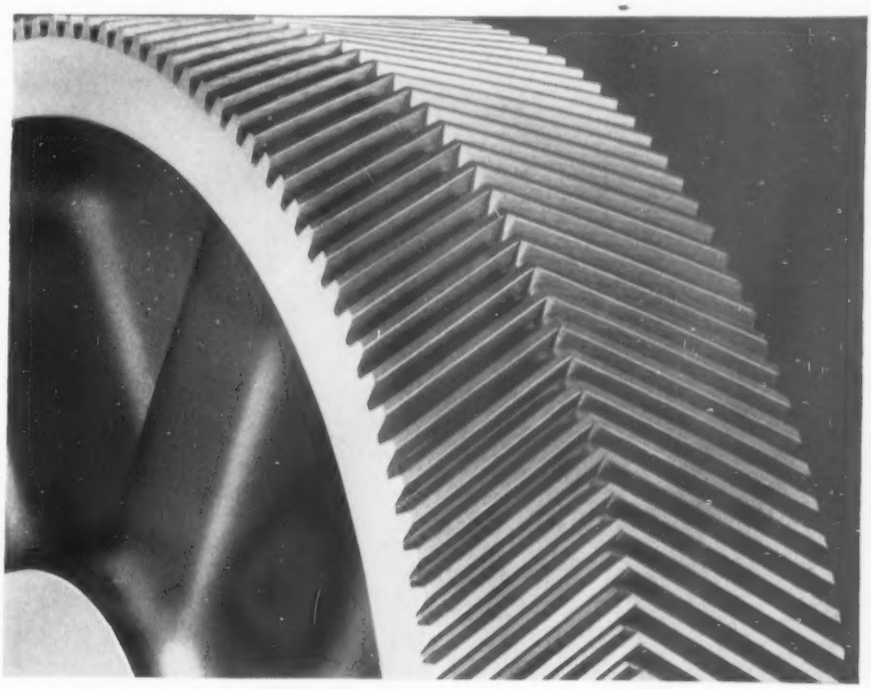
Pittsburgh—General improvement, although small, has been noted in most pipe and tubular goods. Demand has arisen from varied sources, with all lines somewhat better. Oil country goods orders are noticeably improved. Most orders have been filled from field stocks and this demand has not been translated into mill activity, except in certain popular sizes which have had to be replaced from time to time. Jobbers and consumers generally are still buying on a hand-to-mouth basis and are now filling immediate needs.

Cleveland — Demand for standard steel pipe out of jobbers' stocks has shown a moderate improvement this month. Cast iron pipe requirements are unchanged with foundries shipping from stock while operating on one or two day schedules. A number of small municipal projects should materialize soon as the expected increase in WPA activities materializes.

New York—For the Philippines bids are in on 4200 tons of cast iron and a small tonnage of steel pipe, contracts to be placed shortly by H. L. Hershey, purchasing agent, New York. This is the largest export inquiry in months. Except for 1600 tons, yard stocks for New York city, bid March 25, cast pipe inquiry is slow for this season, also buying with foundry operations light in New Jersey. Harrisburg, Pa., has bids on a blanket contract for annual requirements, sellers of French pipe being low. Award, however, will probably be made to a Pennsylvania foundry.

St. Louis—Missouri Rolling Mills Co., St. Louis, has been awarded contract for 20,000 seven-foot steel line posts, braces, arms and parts for the department of commerce, at $11,344.60, bids Feb. 10, schedule 28966.

Boston—Heavier buying of cast pipe has been accompanied by an increase in releases, mostly against blanket contracts. Springfield, Mass., has placed close to 650 tons with the Burlington, N. J., foundry, which is also low on several hundred tons for Gloucester, Mass. For the latter tonnage, a maker of com-



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bination cement pipe quoted an even lower figure. Contract for 10,000 feet of small size wrought pipe went to a district jobber for Camp Devens, Mass.

Birmingham, Ala. — Pipe plants remain on approximately a 40 per cent basis, as a rule, three days a week. Several worthwhile inquiries are out, and some letting aggregating comparatively good tonnages is likely before the end of the month.

San Francisco — Awards last week totaled 822 tons and brought the aggregate for the year to 7285 tons, compared with 7042 tons for the same period a year ago.

Seattle — WPA funds now are available for several proposed water system improvements in the Pacific Northwest and additional bid calls will be out soon. Competition for pending business is apparent as American and French cast iron, steel pipe and transite seek awards. St. Maries and Albion, Idaho, have WPA funds approved for water system extensions. Spokane has $70,269 WPA money for system improvements. Montesano, Wash., will soon call material bids.

Cast Pipe Placed

625 tons, 4 to 16-inch, Springfield, Mass., to United States Pipe & Foundry Co., Burlington, N. J.

194 tons, 4 and 16-inch, Los Angeles, to American Cast Iron Pipe Co., Birmingham, Ala.

174 tons, 4 to 12-inch, Lewiston, Idaho, to Pacific States Cast Iron Pipe Co., Provo, Utah.

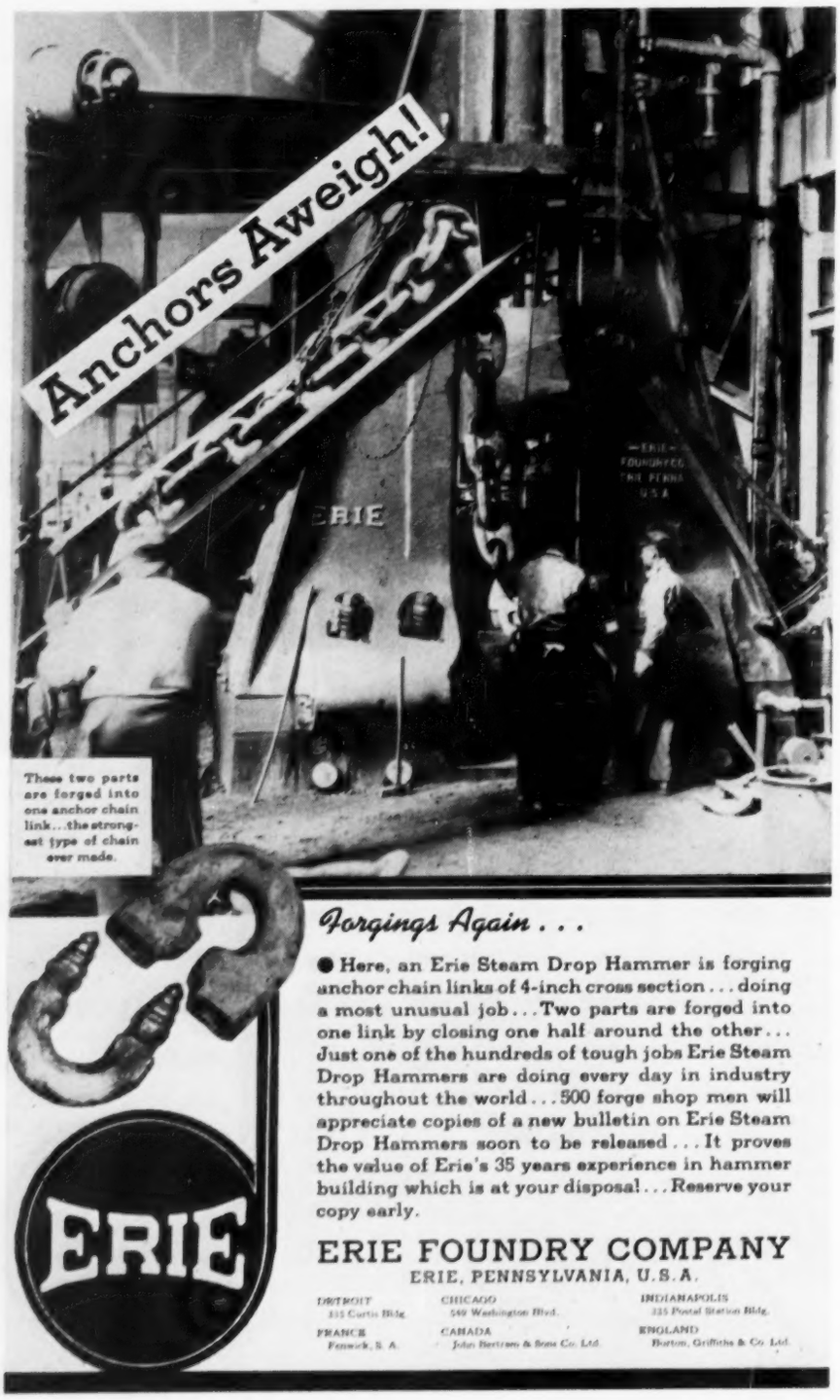
Cast Pipe Pending

2000 tons, estimated, various sizes, water system project, Osterville, Cape Cod, Mass.

1599 tons, 8 to 20-inch, yard stocks, New York city; bids March 25, department of purchase, United States Pipe & Foundry Co., Burlington, N. J., low on 858 tons; Donaldson Iron Works, Emaus, Pa., low on 413 tons; R. D. Wood & Co., Florence, N. J., low on 318 tons.

320 tons, 4 and 6-inch, King county district No. 3, Washington, to Pacific Water Works Supply Co., Seattle; French pipe.

225 tons, 6 to 12-inch, Waltham, Mass.; R. D. Wood & Co., Florence, N. J., low.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Wire

Wire Prices, Page 71

Pittsburgh — Inventories of wire and wire products are being depleted on a wide front and new orders are widely diversified, with the most noticeable increase coming in manufacturers' wire. Merchant wire demand is holding to levels established early in the year and is at slightly better levels than manufacturers' wire. Mill stocks which have been used as a cushion to enable manufacturers to set up some sort of a production schedule have been depleted to the point where general building up is necessary, and it is believed further orders at the present time will be reflected in ingot operations.

Cleveland — A seasonal increase in specifications from jobbers serving agricultural centers has aided measurably in bolstering operations among producers. This improvement is noticeably reflected in requirements for fencing. Some jobbers handling nails and other merchant wire products still have large inventories, but this condition is being corrected.

Chicago — Better demand for merchant wire products is the principal factor in expanding production in the wire industry though some upturn has developed in manufacturers' wire sales. Distributors of barbed wire fencing, etc., are increasing stocks in anticipation of heavier spring sales in farm districts. Lack of major gains in automotive wire needs continues to

restrict activity in manufacturers' wire. March business is expected to be the best this quarter.

New York — While buying of manufacturers' wire is a shade better, demand for merchant products has improved materially, compared with the recent slow rate, although the pace of incoming business is substantially below last year. Spring wire is slightly more active, due to somewhat better demand from the furniture industry, but lack of buying by the automobile industry is seriously felt. In spots there has also been a mild upturn in rope and a few specialties. Wire rod buying continues slow.

Boston—The somewhat encouraging improvement in buying of wire products, centered mostly in merchant goods, has not materially benefited producing mills in this district, output being largely confined to materials entering into the manufacturing trade. Gains in manufacturers' wire and specialties used in most industries have been slight, although in spots there is a mild improvement in demand by makers of machine screw products.

Birmingham, Ala. — Orders for wire products have upward tendency. Mills expect a better showing from the agricultural industry within the month, and report shipments are fairly steady.

Rails, Cars

Track Material Prices, Page 71

Buying by railroads shows no activity, only occasional small lots of cars, locomotives and rails being placed. Chicago Great Western has awarded 4175 tons of rails and 3040 tons of accessories. Ten diesel-electric locomotives have been bought by the New York, New Haven & Hartford and the Chicago, Rock Island & Pacific has leased an equal number.

Canadian Pacific has awarded 2800 freight cars of various types and 25 locomotives, all to be built by Canadian plants.

New York Central will close soon on miscellaneous routine steel for second quarter but has made no move to inquire for rail requirements, usually placed in March.

Ramapo Foundry & Machine Co., Ramapo, N. Y., has been awarded wheels for 500 box cars for the Bangor & Aroostook, which will be built by Magor Car Corp. Other steel for these cars may be awarded soon.

As trucks and bodies for 50 subway cars for the Interboro Rapid Transit Co., New York, will be bought separately it is difficult to appraise the bids recently opened. In any event the company will buy wheels and axles direct.

Car Orders Placed

British-American Oil Co., 29 tank cars, 24 going to the National Steel Car Corp., Hamilton, Ont., and five to the Canadian Car & Foundry Co., Montreal, Que.

Canadian Pacific, 2800 freight cars, 1000 forty-ton box cars, 200 flat cars, 200 stone cars and 50 automobile cars going to the Canadian Car & Foundry Co., Montreal, 950 40-ton box cars, 200 50-ton hopper cars and 100 gondola cars, to the National Steel Car Corp., Montreal; 50 concentrate cars to the Eastern Car Co., New Glasgow, N. S. and 50 refrigerator cars to the Canadian Pacific shops.

Phillips Petroleum Co., 10 propane tank cars, to General American Transportation Corp., Chicago.

Car Orders Pending

New York Rapid Transit Co., New York, 3-car train, contemplated.

Rail Orders Placed

Chicago Great Western, 3060 tons to Carnegie-Illinois Steel Corp., Chicago; 1115 tons to Inland Steel Co., Chi-

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Locomotives Placed

Canadian Pacific, 25 locomotives, 15 of the Pacific type going to the Canadian Locomotive Co., Kingston, Ont., and 10 to the Montreal Locomotive Works, Montreal, Que.

Chicago, Rock Island and Pacific, 10 diesel electric switch engines leased from Electro-Motive Corp., Chicago.

Cold-Finished

Cold Finished Prices, Page 71

Pittsburgh — Orders for cold-finished steel products have shown some increase over the past week and the market is gradually becoming active. Some machinery makers and nut manufacturers have entered the market, while agricultural implement makers are still buying. A few small automotive releases have been noted, but the most interesting factor in the present market is the entry of jobbers in greater numbers. In most cases large stocks laid in by jobbers under last year's low prices are beginning to run out and the fill-in orders over the past few weeks are giving way to more general buying for replacement of stocks.

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Shapes

Structural Shape Prices, Page 70

Pittsburgh — Inquiries are more numerous, although tonnages involved are small. Mill prices are firm and no weakening is anticipated. New projects from both public and private sources are appearing more frequently, and it is hoped better tonnages will soon be forthcoming.

Chicago — Structural inquiries consist principally of bridges, totaling about 1800 tons in Illinois, Indiana and Wisconsin. Awards are light but a fair volume of business is pending and is expected to stimulate bookings in the near future.

Cleveland—Structural fabricators note little change, with inquiries and awards failing to show the expected improvement this month. Inquiries are limited to small tonnages from private sources, although the Cuyahoga county commissioners are expected to advertise soon for the superstructure for the proposed Main street bridge, Cleveland, involving close to 10,000 tons. This will be the largest structural project in this district since Republic Steel Corp.'s new strip mill was awarded to Bethlehem Steel Co. early in 1937.

New York — Bids on 12,355 tons, mostly structurals, for water tunnels and shafts, Putnam and Westchester counties, New York, are followed by an inquiry for 4500 tons for a tunnel, Greenburgh, N. Y., closing April 5 with the board of water supply, New York. This volume together with 4500 tons, readvertised for the Queens land section of the East river tunnel, make up the bulk of pending tonnage with requirements for world's fair structures gradually increasing. Awards are light, led by 1200 tons for the northerly unit, Flushing

Shape Awards Compared

	Tons
Week ended March 26	13,052
Week ended March 19	20,632
Week ended March 12	20,949
This week, 1937	28,151
Weekly average, year, 1937	16,060
Weekly average, 1933	14,232
Weekly average, February	10,059
Total to date, 1937	361,434
Total to date, 1938	185,019

Includes awards of 100 tons or more.

river bridge, New York, placed with Bethlehem Steel Co., Bethlehem, Pa.

Philadelphia — Principal interest is centered on buildings for Penn State college, Penn State, Pa., requiring 3650 tons. Some other state work is scheduled for April 14 and April 22. More apartment house work is being contemplated, but plans appear largely tentative.

Boston — Seasonal improvement has been slow, largely due to a lack of bridge inquiry. Awards approximate 1800 tons, while inquiries run a little more totaling approximately 2500 tons. The New England Mutual Life Insurance building will ultimately take close to 5000 tons, but the steel will not be ready for bids until late this year at least.

San Francisco — Awards are generally confined to lots of less than 80 tons. Awards for the week totaled 740 tons, bringing the aggregate to date to 19,002 tons, compared with 65,459 tons last year.

Seattle — Reports from Denver indicate that Bethlehem Steel Co. is low for furnishing 5000 tons or more of trash racks for the Coulee dam. Week's awards includes 400 tons for a proposed sugar plant at Nyssa, Oreg., reported placed with an eastern interest.

Shape Contracts Placed

1665 tons, city hall, Houston, Tex., to Mosher Steel Co., Houston.

1200 tons, structural supports for refinery equipment in Persia, reported placed by M. W. Kellogg Co., Jersey City N. J., to Belmont Iron Works, Eddystone, Pa.

1200 tons, northerly unit, Flushing river bridge, New York, to Bethlehem Steel Co., Bethlehem, Pa.; L. P. O'Connor Inc., New York, general contractor.

700 tons, industrial building, Norton Co., Worcester, Mass., to Eastern Bridge & Structural Co., Worcester; E. J. Cross Co., Worcester, general contractor.

600 tons, Spaulding high school, Rochester, N. H., to Haarmann Steel Co., Holyoke, Mass.; Rugo Construction Co., Boston, general contractor.

580 tons, material for open-hearth furnaces 2 and 3, Ford Motor Co., Dearborn, Mich., to Whitehead & Kales, Detroit.

570 tons, turbine room and cell building, Michigan Alkali Co., Wyandotte, Mich., to Whitehead & Kales Co., Detroit.

560 tons, building, American Telephone & Telegraph Co., World's fair, New York, to Ingalls Iron Works, Birmingham, Ala.; through Marc Eidlitz & Son, New York.

500 tons, addition to Mercy hospital, Sisters of Mercy, Pittsburgh, to Ingalls Iron Works, Birmingham, Ala.

470 tons, apartments, Yonkers Schact Steel Construction Co., New York; through George T. Kelley Co., New York.

450 tons, addition, public school No. 139, New York, to Dreier Structural Steel Co., New York; bids March 22, steel work direct, fabricating and erecting.

400 tons, sugar factory, Nyssa, Oreg., to Eastern plant.

355 tons, 700 troughs, Michigan Alkali Co., Detroit, to M. H. Treadwell Co., Midland, Pa., and Welding Sales & Engineering Co., Detroit.

325 tons, warehouse, National Can Co., Baltimore, to Frank M. Weaver & Co. Inc., Lansdale, Pa.

300 tons, state bridges Nos. 377 and 378, Owen and Boyd, Wis., to Fort Pitt Bridge Works, Pittsburgh.

282 tons, soft structural bars, schedule 3329, Panama Canal, to Inland Steel Co., Chicago.

270 tons, bridge, Washington county, Kansas, to Fort Pitt Bridge Works, Pittsburgh.

225 tons, bridge 2682-A, Screven county, Georgia, to Virginia Bridge Co., Birmingham.

200 tons, geology building, Colorado School of Mines, Golden, Colo., to E. Burkhardt & Sons Steel & Iron Works Co., Denver.

200 tons, warehouse, bureau of reclamation, Coram, Calif., to Worden-Allen Co., Milwaukee.

180 tons, Seattle baseball park stands, to Pacific Car & Foundry Co., Seattle.

180 tons, manufacturing building, H. J. Heinz Co., Salem, N. J., to Austin Co., Cleveland.

170 tons, school, Beacon, New York, to Belmont Iron Works, Philadelphia; through Sol Lusterbader Inc., New York.

170 tons, state bridge LA-29, Lawrence county, Ohio, to Burger Iron Co., Akron, O.

170 tons, state underpass FAGM-3, Fairfield, Iowa, to Clinton Bridge Co., Clinton, Iowa.

165 tons, two 67-foot deck girder spans, Rhode Island railroad, Sheffield, Ill.,

1

THERE'S A
BLAW-KNOX
BUCKET
FOR EVERY STEEL
PLANT SERVICE

2

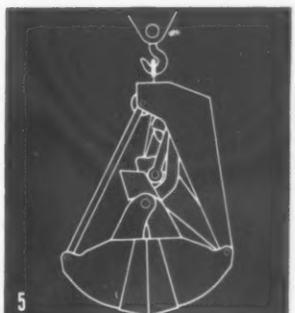
1 Granulated B. F. Slag, comparatively easy digging, permitting use of Blaw-Knox POWER WHEEL BUCKETS with large, hardened, slow-moving bearings—principally a maintenance problem.

3

2 Blaw-Knox ORE BUCKETS four-rope type, low height for high storage, anti-friction sheave bearings—exceptional digging qualities developing 1 to 1 ratio or better.

3 Blaw-Knox Two Line Buckets for hard digging; built at weights suitable for handling O. H. slag, limestone, Spiegel, Ferro Mang., pig iron. Adaptable to overhead cranes and locomotive cranes.

4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6 Blaw-Knox Two Line Buckets for locomotive cranes built at various weights to suit operating requirements including medium weight types adaptable to broad range of service.

4 When "hook-on" operation is necessary, much is gained by using Blaw-Knox 2 line type hook-on buckets. Especially suited to O. H. cinder yard service where 2 hooks are usually available.

6

5 Blaw-Knox Single Line "Hook-On" Buckets. Heavily built for O. H. service and medium weight types for handling roll scale, also for handling clay and other materials in O. H. Ladle House.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
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Behind the Scenes with STEEL

Report Cards

■ Many firms are now getting out what is known as a "report to jobholders," differing from the routine report to stockholders. Of these recent innovations, STEEL's editors particularly admired that of Johns-Manville, noteworthy for the elimination of the usual high and dry financial hocus-pocus. It shows the 1937 Johns-Manville situation in simple, down-to-earth statements, clarified even more by brief sketches and line drawings such as those showing enviable sheafs of folding money actually changing hands. With such statements as "In 1937 we purchased, produced and used the following raw materials. . .", "From these raw materials we manufactured the 1300 kinds of J-M products including. . .", and "We billed our customers for these in the amount of . . .", the presentation continues graphically on down to J-M products and how they are sold. Of particular interest was the balance sheet, one side headed "We Owned," the other "We Owed and We Were Worth." For stimulation of employes' interest in their company, the J-M report should stand as a new high.

Spare No Expense

■ Shrdlu's New York grapevinist and ear-to-the-grounder, Les Browne, associate editor of STEEL, forwards another example to add to our collection of New and Interesting Ways to Address Industry's Outstanding Harbinger. This time it's "STEEL PROD. PROCESSING DISTB. USE," the form of address always used by the Ste. Hghwy. Dprtmnt at 165 Cptl. avn in Hrtfrd., Cnnctct.

Stamping at the Savoy

■ Continuing our practice of never letting a new label head slip into STEEL without calling your attention to it, we point to the new Stamping cut on page 46. When the original drawing was first sent up from the art department, STEEL's engineers puzzled over just what manner of product the young man in the picture was removing from the press. Thinking that artist Pat Dwyer had been caught in a flight of surrealism, an explanation was requested. Pat sent up a photograph from which he had taken his idea. The original photo was taken in the Boeing plant and the stamping is a door frame for a giant airliner. Greatly relieved, we can again say, "STEEL Is Modern"—we had suspected the stamping was a hunk of horse harness.

Recipe for a Snorter

■ Practically the only time the eds. punch their typewriters with tongue in cheek is in writing heads for feature cuts such as the one on page 44, which proclaims to the world that "There's Alloy In Your Lemonade." Following almost on the heels of one entitled "There's Welding in Your Beer," it's getting so a guy can't take a drink now days without tasting phosphorous, manganese, chromium, moly, vanadium, or even zirconium in the dregs, not to mention, of course, the usual double slug of Haig & Haig.

Financial Note

■ Loyal Reader Stuart Mills of North Olmstead, O., had his toes trodden on by the circulation department when they misplaced his renewal check. Mr. Mills comments: "Maybe you need a new bookkeeper instead of so many optimistic editors."

Why, Mr. Mills, our editors are so pessimistic about economic conditions that one of them just bought a suit with three pairs of pants, another decided times were too hard to get married in and is buying a new car instead, and a third won't go to see Snow White and the Seven Dwarfs because it has a happy ending. Nope, what we really need is an optimistic bookkeeper.

—SHRDLU

to Wisconsin Bridge & Iron Co., Milwaukee.

160 tons, store building, E. Mithoff Nicholas, Columbus, O., to C. E. Morris Co., Columbus, O.

150 tons, building, Singer Sewing Machine Co., St. Louis, to Mississippi Valley Structural Steel Co., Decatur, Ill.

165 tons, additional cellars, Frankenmuth Brewing Co., Frankenmuth, Mich., to Whitehead & Kales Co., Detroit.

120 tons, boiler room extension, Winnetka, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

120 tons, hangar doors, naval base, Norfolk, Va., to Bristol Steel & Iron Works Inc., Bristol, Va.

110 tons, shapes and bars, west approach, Connecticut river bridge, Middletown, Conn., to American Bridge Co., Pittsburgh, and Truscon Steel Co., Youngstown, O.; Arute Bros. Inc., New Britain, Conn., general contractor.

110 tons, bureau of reclamation, spec. 1036-D, Boulder City, Nev., to American Bridge Co., Pittsburgh.

100 tons, shapes and bars, riding hall, Fort Hoyle, Md., to Bristol Steel & Iron Works Inc., Bristol, Va., and Acme Steel Engineering Co., Baltimore; bids March 10.

100 tons, shapes and bars, school, Belfast, N. Y., to Buffalo Structural Steel Co., Buffalo, and Bethlehem Steel Co., Bethlehem, Pa.; L. H. Ludwig Inc., Falconer, N. Y., general contractor.

Shape Contracts Pending

12,355 tons, including 800 tons of plates and 785 tons, reinforcing steel, tunnels and shafts, West Branch-Kensico section, Delaware aqueduct, Putnam and Westchester counties, New York; contract 322, Utah Construction Co., Ogden, Utah, low; contract 323, Seaboard Construction Co., New York, low; contract 324, Arthur A. Johnson Corp. and Necarro Co., joint bidders, low; bids March 24 to board of water supply, New York; work also takes 95,000 linear feet, 2½-inch steel pipe for grouting and 45,000 pounds, gradings, ladders, etc.; see STEEL, March 14, for breakdown on materials.

5000 tons, office building, New England Mutual Life Insurance Co., Boston; Turner Construction Co., general contractor. Steel estimates will not be taken for some months.

4500 tons, structural supports, middle section, Kensico-Hill View tunnel, Greenburgh, N. Y., Delaware Aqueduct project; bids April 5, contract 307, board of water supply, New York. Work also takes 105 tons, inner lining and risers; 115 tons, reinforcing and miscellaneous steelwork and 30,000 linear feet, 2½-inch steel pipe for grouting.

4500 tons, Queens land section, Queens-Manhattan East river tunnel, New York; readvertised.

3650 tons, miscellaneous buildings for Penn state college, State College, Pa.; bids March 29, to be opened by the state authority.

2500 tons, bridge, Canal street, New York; James Stewart & Co., New York, low.

900 tons, county bridge, Torrence avenue and 138th street, Chicago.

850 tons, armory, Morristown, N. J.

650 tons, warehouse and transportation building, National Can Co., Baltimore.

630 tons, five state bridges, Indiana.

610 tons, building, General Realty & Utilities Corp., New York.

600 tons, underpass, Wickford Junction, R. I.; bids next month.

600 tons, bridge, St. Louis San Francisco railroad, Pacific, Mo.

560 tons, Oldham prison, La Grange, Ky., for state of Kentucky.

550 tons, State Cancer hospital, Buffalo, plans revised; bids April 14.
425 tons, building, Borden Co., World's fair, New York.
410 tons, steel sheet piling, state procurement office, treasury department, San Antonio, Tex.; bids April 1, schedule 32597; structural steel and galvanized steel pipe also included in inquiry.
400 tons, Deer Creek dam, Charleston, Utah.
400 tons, department store, Raleigh, N. C.
400 tons, state sanitorium, Butler, Pa., Mathew Cummings, Boston, low on general contract, with a bid of $1,480,000; 830 tons of reinforcing bars also will be required.
350 tons, addition to coal breaker, Glen Alden Coal Co., Ashley, Pa.
300 tons, addition to state penitentiary, Frankfort, Ky.; bids in.
300 tons, school, Cambridge, Mass.; bids April 5.
300 tons, building, Frank E. Powell, Columbus, O.
278 tons, under-crossing, Northern Pacific tracks, Missoula, Mont.; bids March 30.
250 tons, Hemmenway gymnasium, Harvard University, Cambridge, Mass.; bids soon.
250 tons, administration building, Buffalo airport, George W. Walker Inc., Buffalo, low.
225 tons, overpass, Shubuta, Miss.
200 tons, county bridge, Irving Park boulevard, Chicago.
200 tons, store, Montgomery Ward & Co., Lexington, Ky.
180 tons, alterations to Georgia-Randolph building, Chesapeake & Potomac Telephone Co., Washington.
155 tons, garage, Eastern Massachusetts Street railroad, Fall River, Mass.
150 tons, building, International Harvester Co., Portland, Me.
150 tons, voting machine storage building, Baltimore.
135 tons, building, Continental Baking Co., World's fair, New York.
130 tons, alterations to building No. 13, H. J. Heinz Co., Holland, Mich.
125 tons, building, Ballinger Co., Orange, N. J.
120 tons, power house, Brawley, Calif., for Imperial irrigation district; Bethlehem Steel Co., Los Angeles, low.
100 tons, state bridge, Plattville, Wis.
100 tons, Scajaquada creek bridge, Buffalo; Cedric W. Wood, Snyder, N. Y., low.
Unstated tonnage, but aggregating substantial part of 12,000 tons required, trashracks, including 10 outlet works structures, 18 main-unit penstock structures and three station service structures, Grand Coulee dam, Washington; Bethlehem Steel Co., low on items 1 and 2 at $323,026 f.o.b. Chicago; item 3, John Beam Co., $19,750 f.o.b. Peotone; item 4, Mississippi Valley Structural Steel Co., Decatur, Ill., $58,300 f.o.b. destination; item 5, Truscon Steel Co., Youngstown, O., $5158 f.o.b. Youngstown; bids March 16, bureau of reclamation, Denver, spec. 777.

Reinforcing

Reinforcing Bar Prices, Page 71

Cleveland — Definite progress was made last week in connection with the Main street bridge, Cleveland, when Cuyahoga county commissioners advertised for two river piers, involving close to 186 tons. Bids are due April 21. The same commission is expected to advertise for the remaining nine piers and the superstructure in the near future, involving 220 tons and approximately 10,000 tons respectively.

Chicago—Inquiries are more numerous, improvement being most noticeable in smaller jobs. A fairly substantial tonnage is pending, with additional business from state highway departments in prospect.

Pittsburgh—Outlook is somewhat improved, with the advent of spring weather bringing out new projects in larger numbers. Prices are firm in most sections.

Philadelphia — Reinforcing bar business has been negligible. State work is declining although most of the pending tonnage is for state projects.

Boston — Several hundred tons reinforcing steel has come out for estimates, mostly public work with few outstanding inquiries. Awards, mostly highway needs recently bid, approximate 500 tons. Diversion of highway funds from uses originally designated has hampered bridge and road plans.

New York — With the exception of mesh for New York state high-

DESIGNING · ENGINEERING · MANUFACTURING
DEEP DRAWN SHELLS AND SHAPES
RIGHT—Seamless shell drawn by Hackney
Hackney
MILWAUKEE
ABOVE—Diffuser tube deep-drawn seamless by Hackney for a large air conditioning company
RIGHT—Seamless tapered shell made from one continuous piece of steel without a joint of any kind
RIGHT—Condenser shells or liquid receivers are advantageously made by the Hackney process

The Hackney Method Assures

UNIFORMITY—DEPENDABILITY—SATISFACTION

Manufacturing competence, designing skill and over thirty years of close co-operation with manufacturers and design engineers are your assurance of the satisfaction and economies obtained in the containers and special shapes produced by the Hackney method.

Cold drawing of seamless containers from metal plates was pioneered by the Pressed Steel Tank Company. Numerous metals have been used in developing Hackney containers in a wide variety of shapes for many industries. Hackney welding has won recognition for its superiority.

If you use or need metal shapes or shells, send the details and let Hackney engineers help solve your problems or make practical suggestions for improvements. There is no obligation.

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Containers for Gases, Liquids and Solids

GRAMMES SERVICES:—

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Chemically engraving characters and design in metal with chemical and enamel coloring.

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An offset process permitting artistic effects on metal thru the use of vivid colors and pallid tints.

EMBOSSING
Design, wording, or characters are raised in relief or impressed in metal.

HARD ENAMEL
Prime color enamels are inlaid on metal and then baked at 1400° F.

MET-A-LABELS
The embossing and printing in colors on very thin metal joined to a paper back with or without glue back.

STAMPINGS
An unending variety of things stamped and formed out of ferrous and non-ferrous metals.

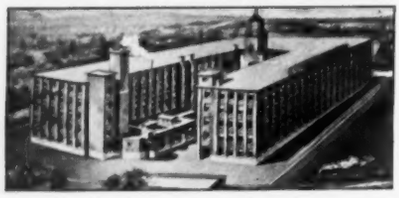
WIRE FORMING
Products formed of flat, round or half round wire.

FINISHING
Electro-plating, chemical coloring, japanning, spray lacquering, enameling.

MACHINERY
Building of machinery for cigar box, brush, wood product and other manufacturers.

ASSEMBLING
The complete assembling of metal units under careful supervision for accuracy and workability.

TOOLS & DIES
Our experience is wide, having made over 10,000 tools and dies.



ESTABLISHED 1875

L. F. GRAMMES & SONS,
INCORPORATED
ALLENTOWN, PENNSYLVANIA

way needs, new inquiry for reinforcing steel has declined. Material required for water tunnels bid late last week, 785 tons, will not be needed until late this year at the earliest. Buying for world's fair buildings in small lots is increasing.

San Francisco — Little new work has developed recently and pending tonnage does not exceed 3900 tons. Awards aggregated only 420 tons, bringing the total for the year to 22,720 tons compared with 19,270 tons in 1937.

Seattle — Business is not improving, few construction projects being under way. Awards totaled 300 tons. The Washington-Idaho state bridge involving 700 tons is still pending.

Reinforcing Steel Awards

300 tons, state office building, Jefferson City, Mo., to Sheffield Steel Co., Kansas City, Mo. Reported in March 12 issue to unnamed interest.

283 tons, memorial auditorium, Burlington, Iowa, to Ceco Steel Products Corp., Omaha; Peter Kiewit Sons Co., Omaha, Nebr., general contractor.

200 tons, elevator building, Russell-Miller Milling Co., Minneapolis, to Laclede Steel Co., St. Louis.

187 tons, domestic science building, Springfield, Ill., to Laclede Steel Co., St. Louis.

150 tons, Seattle ball park stands, to Seattle Steel Co., Seattle.

150 tons, Washington state highway projects, to unnamed interests.

150 tons, platforms, subway and miscellaneous construction, Central Railroad of New Jersey, Elizabethport, N. J., to Joseph T. Ryerson & Son Inc., Jersey City, N. J.; J. F. Chapman & Son, Hillside, N. J., general contractor; reported last week as going to another distributor.

125 tons, Rockne memorial building, Notre Dame, Ind., to Olney J. Dean Steel Co., Chicago.

115 tons, highway work, Pima and Graham county, Arizona, to unnamed interests.

103 tons, highway work, San Diego county, California, to unnamed interest.

100 tons, school building, Mound, Minn., to Truscon Steel Co., Youngstown.

1150 tons, Back river sewage disposal plant, Baltimore; Virginia Engineering Co., Newport News, Va.

Reinforcing Steel Pending

2500 tons, U. S. engineer, Baltimore, for Kingston, Pa.; bids April 5.

830 tons, state sanitorium, Butler, Pa., Mathew Cummings, Boston, low on general contract; 400 tons structurals also required.

500 tons, Queens land section, Queens-Manhattan East river tunnel, New York; readvertised.

500 tons, prison, LaGrange, Ky.

400 tons, vault for mint, San Francisco; bids April 1.

300 tons, hospital, Ann Arbor, Mich.

300 tons, doctors' hospital, Washington.

300 tons, Illinois Bell Telephone Co. building, Springfield, Ill.

272 tons, crossing, Northern Pacific Co. tracks, Missoula, Mont.; bids March 30.

200 tons, bureau of reclamation, Denver, Colo., schedule A-46560-A; bids March 31.

200 tons, bridge, Martindale, Mont.

186 tons, two river piers, for Main street bridge, Cleveland; bids April 21 to Cuyahoga county commissioners. Inquiries for nine piers for the same project should appear in the near future.

185 tons, highway project, Glocester, R. I., to Connecticut state line; Aruto Bros., Inc., New Britain, Conn., general contractor bids March 21, Providence, R. I.

170 tons, chemical building, West Lafayette, Ind.

150 tons, foundations, bridge over Raritan river, Woodbridge, N. J.

110 tons, bridge, Canal street, New York; James Stewart & Co., New York, low.

100 tons, Peoples store, 112th street, Chicago.

100 tons, building, Ford Motor Co., World's fair, New York.

100 tons, state cancer hospital, Buffalo; plans revised; bids April 14.

Concrete Bars Compared

	Tons
Week ended March 26	1,413
Week ended March 19	7,949
Week ended March 12	4,288
This week, 1937	3,878
Weekly average, year, 1937	6,266
Weekly average, 1938	5,102
Weekly average, February	5,208
Total to date, 1937	51,721
Total to date, 1938	66,325

Includes awards of 100 tons or more.

Pig Iron

Pig Iron Prices, Page 72

Chicago—Pig iron shipments continue substantially ahead of the rate a month ago. Consumption is increasing moderately, with pig iron deliveries stimulated additionally by foundries' stock depletion and resulting need for taking fresh tonnages. Betterment in foundry schedules is most apparent among jobbing plants, automotive and farm implement operations showing little change. New pig iron business is light, being confined to short-term requirements. Market is steady at $24, furnace, for No. 2 foundry and malleable.

Cleveland — Pig iron sellers continue to operate under substantially reduced schedules, reflecting the low operations of most foundries. Little new business has been booked this month with most orders representing releases on former contracts. No weakness in prices has been noted.

New York — Sales show little change in volume. According to some leading sellers, orders are about on a parity with those already in the market and continue to represent only immediate needs.

Washington — Alan Wood Steel Co., Conshohocken, Pa., is low on 250 tons of low phos pig iron for the Washington navy yard at $26.41, delivered, bids March 22, schedule

3036, bureau of supplies and accounts, navy department. Three other bidders quoted $31.35, delivered.

Philadelphia — Pig iron buying continues hand-to-mouth and spotty, with some sellers reporting a slight improvement in specifications, while others note little change. Since the Birdsboro, Pa., stack was blown out recently, production continues unchanged.

Cincinnati — Southern iron shipments against contracts are moderately heavier in anticipation of freight rate increase, but Northern iron is moving better only in reflection of depleted inventories. Tonnage of both, however, will be greater than in January or February. Buying remains restricted to immediate needs. Melt is spotty at about 30 per cent of district capacity. Some stove foundries are maintaining steady, but seasonally light, schedules.

Buffalo — Gains in shipments at other centers are not reflected here, local mills being largely dependent on automotive trade for orders. Inquiries from motor and accessory lines are slow.

Boston—Pig iron buying for second quarter has been smallest in recent years, rarely for more than a single car. This reflects low foundry operations by consumers with small supplies. While most large consumers are also melting at an equally slow rate, they are drawing on stocks. One large user in the Providence, R. I., district has built up stocks materially. While freight rate advances, based on Everett, Mass., will not be large, they will apply to more delivery points than in the adjustments last November. This time the 10 per cent advance will apply to points on the New York, New Haven & Hartford railroad, mostly short hauls, but numerous, especially in Connecticut.

St. Louis—Pig iron sales have increased moderately, but are confined to small lots, from single cars to 200 tons, for prompt shipments.

According to sellers it is impossible to interest clients in distant requirements. Sales even for second quarter are rare, and so far as can be learned, there has been no inquiry for third quarter.

Birmingham, Ala. — Production of pig iron currently is somewhat off, with the situation somewhat confused although indicative of an upturn.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—Tin plate operations are slightly better at 60 per cent of capacity, with hot and cold-rolled about equal. Substantial production is in preparation for the June pea pack, which is placed by advance estimates at about the same level as last year. An experiment which is now underway is in the canning of grape juice. One large producer has reported satisfactory progress. Export demand is at least equal to the previous month's business.

Scrap

Scrap Prices, Page 74

Pittsburgh — Mills are still out of the market generally, although rising steel production schedules would seem to indicate they must soon buy scrap. This situation means a continuation of present prices, which are poised half-way between the influences of domestic and export demand.

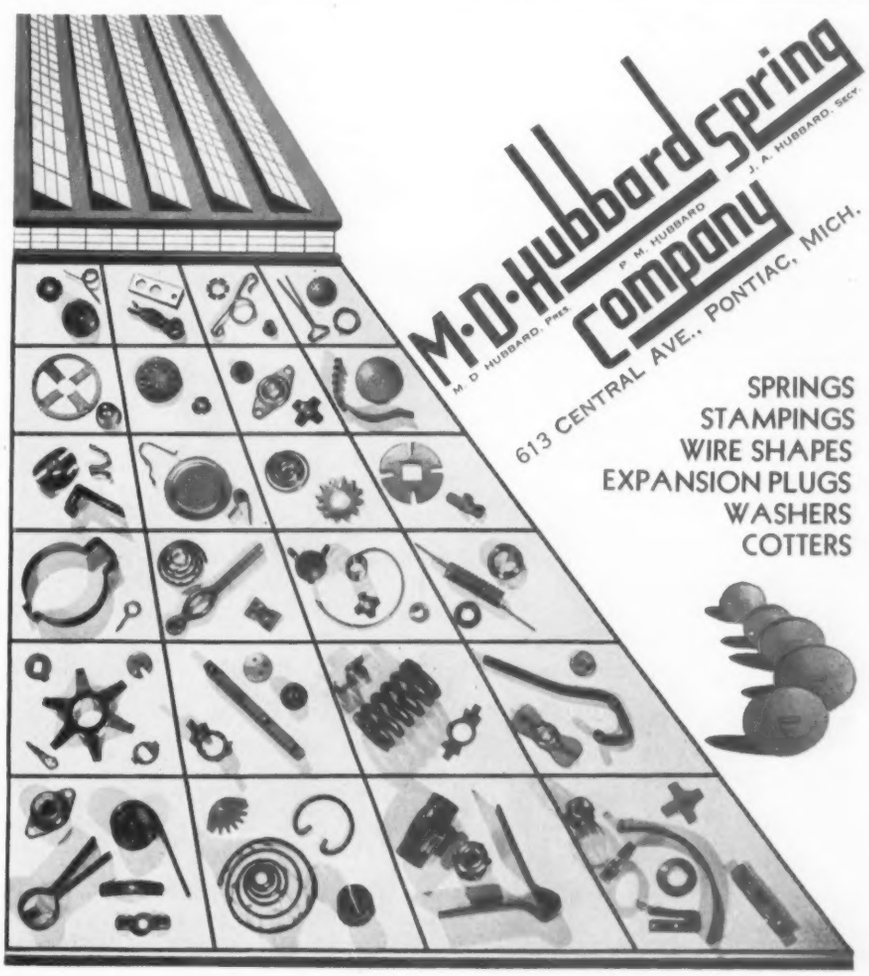
Detroit—Anticipatory declines in scrap prices of 50 cents to $1 per ton have been registered, with regular monthly lists scheduled to appear beginning Tuesday. Further decreases are expected as a result of the absence of buying and the crowded position of dealers' yards.

Cleveland — Inactivity in iron and steel scrap has reached the point that scrap is not being gathered. The low prices also are not conducive to collection. Important buyers of scrap are not interested in scrap in quantity even at low prices, for yard stocks still are heavy.

Philadelphia — Prices on all leading grades of scrap are holding nominally unchanged, with No. 1 steel for domestic account at $14 to $15, delivered, and No. 2 at $12 to $13.50. For export the market for No. 1 steel continues as high as $14.50, and No. 2 at $13.75, although this is exceptional, with $13.50 the more representative. One cargo of No. 1 and No. 2 steel was loaded last week for Italy, with another being loaded for Germany.

The largest reported purchase of scrap for domestic account involves 2000 tons of a particular grade of yard steel for Harrisburg, Pa., consumer, bought at $10.50, delivered. This buyer, on the other hand, is holding up temporarily on shipments of heavy breakable cast scrap. The Pennsylvania railroad has just brought out an exceptionally light list for bidding April 6.

Pennsylvania Public Utilities com-



mission has approved rate advanced on switching and other miscellaneous charges which were intrastate in nature.

New York — Several scrap grades for domestic delivery are slightly easier, although lack of buying allows little test of prices. For export, all brokers are now paying $12.50, barge, for No. 1 heavy melting steel, but are not pressing for tonnage. The outlook for foreign business is clouded and England is holding up shipments of some old orders. Buying for export has declined to scattered cargoes at lower prices.

Chicago — While scrap prices tend toward weakness, heavy melting steel is nominally unchanged at $12 to $12.50, with sellers generally unable to obtain this grade at less than the lower figure. Consumer demand remains slow despite recent gains in steelmaking but offerings also are limited. Heavy melting steel on recent railroad lists has commanded around $12.60, delivered.

Cincinnati — Mill outlets for sheet clippings are reopened for moderate tonnages, bringing a 50-cent restoration to dealers' buying prices. Other grades of iron and steel scrap remained nominally unchanged in a dull market. Interest in further purchases is so low that no scrap lists were published this month by the Louisville & Nashville or Norfolk & Western. Mills are relying on scrap inventories and foundry needs continue unimportant.

Buffalo — Sales of small lots of No. 1 heavy melting steel, aggregating slightly more than 2000 tons, at $13 a ton, bolstered the undertone of the iron and steel scrap market during the current week.

Some dealers are afraid that the weakness in the Detroit market may tend to depress local prices as the lake navigation season is expected to get under way around the middle of next month. The market here is forced to contend with shipments from upper lake ports when price differentials between the areas more than make up for shipping charges.

Boston—Dullness prevails in all grades of iron and steel scrap, domestic buying being sluggish with export activity gradually declining in view of completion of shipments against most pending tonnage. Shiploading continues, but less actively. While $13, dock, is offered for No. 1 heavy melting steel, one dealer is quoting $12.50, and none is apparently anxious to cover far beyond immediate needs for cargoes. Foundry grades in New England for district delivery are slack with a few irregular calls for textile machinery at $15, delivered at most points. Eastern Pennsylvania, which will take a freight of $4.85 under the new rates, is showing little interest.

St. Louis—Iron and steel scrap continues quiet, with no indications for betterment. Prices are largely nominal. The only sale reported was 2000 tons of No. 2 heavy melting steel to an east side melter for delivery over the next 60 days, at $11.50 per ton.

Seattle — Exporting houses are marking time, recent advices from Japan stating that under the cartel system, limiting imports to 300,000 tons a quarter, commitments have been placed to carry over until third quarter. Consequently no buying before June is expected. Meanwhile tidewater stocks are large and dealers are taking only attractive lots at low prices. In the absence of sales, No. 1 is generally said to be about $8 but dealers are reported to have bought as low as $6. Prices are too low to stimulate shipments from the interior. Mills are out of the market and sales to foundries are unimportant.

Birmingham, Ala. — Scrap remains without a noteworthy feature. Buying is in small and scattered lots, most No. 1 cast and with little steel scrap moving.

THE HANNA FURNACE CORPORATION

MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION

Buffalo Detroit New York Philadelphia Boston

Warehouse

Warehouse Prices, Page 73

Boston—Improvement in warehouse volume has been meager and far below the usual early spring volume. Buying by industrial and manufacturing consumers is notably slack with dullness in the textile machinery field. Volume also varies considerably in various sections, warehouses at several centers doing better than those in the immediate Boston area. These are reacting to better demand for steel needed on farms.

New York—Warehouse sales have improved and are running ahead of the first two months of the year, but aggregate volume is slow for March with the seasonal upturn well below normal. Lighter lines of specialties and alloys are making the best showing with heavier items dull.

Philadelphia — Warehouse demand shows further slight expansion. This improvement does not appear to be confined alone to building trade requirements, but affects a wide variety of items. This situation has caused some resellers to speculate on the possibility the present increase may be due to other than seasonal influences. They point out purely seasonal conditions should not necessarily account for improvement in demand for tool steel, such as is now being noted. However, sufficient time has not elapsed to permit definite conclusions. Meanwhile, prices are unchanged.

Cleveland — Warehouse distributors report daily average sales and shipments this month are about on a par with February. However, distributors feel that March will have a slight edge over last month. Prices are firm with but a few exceptions now and then among the smaller distributors.

Buffalo—Compared with January and February warehouse sales for March are good. Volume, however,

is considerably below the corresponding periods of last year. Slight increase in orders is due mostly to seasonal factors as buying centers on farm and specialty items.

Cincinnati — Warehouse business shows little change, sales failing to reflect usual March improvement. Inquiries on building materials are scarce. Price schedules will hold temporarily pending complete clarification of the effect of freight rate increases.

Chicago—Business continues regulated principally by seasonal factors, and March is expected to be the peak month of this quarter.

St. Louis—Seasonal requirements are becoming more evident and better weather has helped the movement of some items. Wire and wire products have developed decidedly greater activity, especially fencing and accessories. Distributor stocks of wire screening are reported light and orders from the country are in considerable volume.

Detroit—Slackness continues in warehouse sales with new tool and die programs disappointingly slow. Business is on a par or slightly below the level of February and there are no prospects of immediate improvement. Warehouse stocks of steel are normal. Prices are unchanged.

Seattle — Jobbing trade is quiet, volume being less than usual at this season. Lack of construction work is retarding sales while some pending building contracts are being postponed because of labor disputes. No item is in particular demand. Sales are in small tonnages. Prices are firm.

Ferroalloys

Ferroalloy Prices, Page 72

New York — Shipments of ferromanganese for March will show only a small increase in the daily average, according to leading sellers. At the moment volume is about keeping pace with the slight expansion in steelmaking operations and considering that there was little or no increase during the early part of the month, the present gain will have small bearing on the daily average.

While freight rate increases on less-than-carlots become effective March 28, the new schedule on carlots, which affect ferromanganese shipments primarily, will not be applied until April 11 on interstate shipments. The Pennsylvania Public Utilities commission has approved the freight advances to apply on intrastate shipments.

Domestic spiegeleisen, 19 to 21 per cent, is holding at $33, Palmerton, Pa., and 26 to 28 per cent, at $39. As noted at the time, these prices also were reaffirmed March 14 for second quarter. Shipments are increasing slightly.

Other leading ferroalloys are also unchanged in price, with buying light in line with the continued restricted but mildly improved rate of steel production. This steadiness applies at present to ferrotungsten, which is governed in no small measure by the price of tungsten ore. At the moment this ore price, as has been the case for some time, is being governed by the European market, as there is little or no ore buying in this country.

Iron Ore

Iron Ore Prices, Page 74

Cleveland — Lake Superior iron ore consumed by blast furnaces during February, according to the Lake Superior Iron Ore association, was 1,776,585 gross tons. This is slightly less than the 1,923,056 gross tons consumed in the preceding month but only 40 per cent of the 4,443,306 gross tons consumed in February, 1937. Stocks of iron ore at lower lakes port and furnaces March 1, were approximately 14,741,000 tons more than on the comparable date last year, reflecting substantially reduced steelworks operations over the last four months. Total ore on hand at lower lake ports and furnaces on March 1 follow:

	Furnaces	Lake Erie docks	Total
March 1	31,383,307	5,775,094	37,158,401
Mo. ago	33,007,075	5,874,757	38,881,832
Year ago	19,080,524	3,337,168	22,417,692

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—Steadiness characterized domestic nonferrous metal markets last week. Sentiment improved here on a slight gain in sales and an increase in actual consumption of copper, zinc, and tin. The foreign markets have been sustained by a continuation of buying for armament purposes but price levels at the close were slightly below those prevailing when the European political situation was tense. Weakness in Wall street had a depressing effect on metals abroad.

Copper — Export copper closed around 9.80c, c.i.f. European ports, compared with around 9.85c at the end of the previous week. Demand for export copper has been an important factor in absorbing surplus supplies offered by custom smelters. Japan was a heavy buyer on Friday. Electrolytic held at 10.00c, Connecticut. Brass mills have boosted operations somewhat above 35 per cent of capacity.

Lead — Prices held unchanged at 4.50c, New York, and 4.35c, East St. Louis, in generally quiet markets. The increase of 4733 tons in refined stocks during February, decline in shipments, and the moderate curtailment in production had no outward effect on the market.

Zinc — Inquiry here was confined to occasional carlots for prompt delivery. Prime western held at 4.25c, East St. Louis.

Tin — Prices fluctuated within narrow limits, from a high of 41.50c to a low of 41.10c on Straits.

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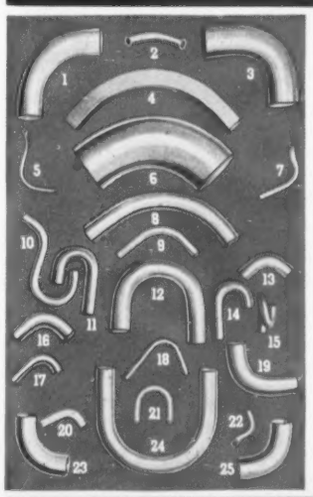

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Says Texas Ore "Affords Real Opportunity"

■ Texas has "immense fields of iron ore" which are awaiting development, Dr. Nicholas C. Hamner, president, Southwestern Laboratories, Dallas, says in reporting a survey of the natural resources of the Southwest to American Chemical society, which will hold its ninety-fifth meeting in Dallas, April 18-22.

"The fields are centered in East Texas, within 200 miles of Dallas," he states. "The ore occurs for the most part in large pockets and can be worked with steam shovels. When washed and ready for delivery it will run from 47 to 50 per cent metallic iron.

"Within 150 miles are immense quantities of limestone. The only material needed to be shipped is coke.

"The state at one time operated a furnace of 125-ton capacity with convict labor, as well as a pipe foundry. Convict labor was not adapted to this work.

"It may be said with confidence that the iron ore deposits of Texas afford a real opportunity for industrial expansion in the Southwest."

New Records Set for Tin Consumption, Production

■ A series of new records was established in the tin industry in 1937, according to final compilations by the International Tin Research and Development council. World production reached a record of 206,900 tons, exceeding 1936 by nearly 27,000 tons.

World consumption at 197,300 tons was also at a record level, an increase of 36,600 tons over 1936.

Consumption in the United States last year was the highest ever recorded at 86,663 tons, nearly 19 per cent over 1936. The total quantity shipped to the U.S.S.R. was more than 25,000 tons, about 2½ times the previous year's record of 9664 tons. Nearly 26,000 tons was taken by the United Kingdom, where consumption was the highest for ten years. Tin consumption in Germany increased by 37½ per cent over 1936 to 11,643 tons in 1937. Consumption in Japan reached a record of 8200 tons.

About 65,000 tons of tin was used in the manufacture of tin plate in 1937 against 62,000 tons in 1936.

Has Faith in Labor, If Labor Is Left to Decide

■ "Labor itself, if left to form its own program will achieve harmony between workers and management," J. A. Voss, director of industrial relations, Republic Steel Corp., told the Gray Iron Founders society, in convention in Buffalo last Friday.

"Eventually the workers are going to have exactly the kind of labor relations they want. If left to themselves I am confident they will work out a system of employer-employe relations suitable to their own best interests and the interests of their employers."

Why Steel Plows Scour Revealed by Research

■ A hundred years ago this spring, John Deere took out his first steel plow and proved that it would scour in sticky prairie soils where preceding plows had failed. Never till now, a century later, has anyone known why hardened steel scours where iron or soft steel will not.

In a paper, "Dynamic Properties of Soil," appearing in February *Agriculture Engineering*, F. A. Kummer and M. L. Nichols have shown this is due to the "wettability" of the metal by the soil moisture. Their research included study of plow steels, similar steels with various impurities and alloys, cast irons and special metals such as monel and ferrous and nonferrous alloys. Figures used to express the degree of wetting ranged from 51 to 83 with cast irons at the bottom of the scale as forecast by the work of John Deere a hundred years ago.

Of particular interest is the fact that the two metals showing the highest resistance to wetting were in the stainless steel class.

NEMA Issues Standards For Welding Electrodes

■ Standards for welding electrodes recently adopted by Electric Welding section of National Electrical Manufacturers' association are now available at the association's headquarters at 155 East Forty-fourth street, New York. Principal functions of these standards are to define various classes of metallic arc welding electrodes and to standardize packaging, diameters and lengths.

Standards list and define 9 classes of electrodes. This alone is expected to eliminate a large amount of confusion and misunderstanding in the trade if widely adopted.

ASA Standards Published in Manual

■ Manual 3801, containing a complete indexed list of engineering and industrial standards and safety codes has been published by American Standards association, 29 West Thirty-ninth street, New York. Some of the industrial standards covered by this February issue include civil, mechanical and electrical engineering, automotive, chemical, textile, mining and wood industries.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 71

Gains in bolt, nut and rivet speci-

fications compared with a month ago are slight and principally from miscellaneous users. Railroads have ordered some track bolts, but purchases for freight car building and repairs are light. Steady demand continues from farm equipment manufacturers, with requirements of automotive parts makers generally little changed. Jobbers' specifications show moderate improvement since a month or two ago.

Chrome Ore Comes In

Philadelphia — Arrival of 8925 tons of chrome ore was a feature of importations here during the week ended March 19. One shipment of 5044 tons came in from Cuba, while another, involving 2681 tons, arrived from the Philippine Islands.

Iron and steel importations included 151 tons of sponge iron, 79 tons wire rods, 46 tons steel bars, 45 tons steel tubes and 44 tons steel forgings, all from Sweden.

Equipment

Chicago—March business in machine tools appears likely to show a gain over February despite some slowing down in sales the past week. Inquiries also have tapered following fairly good volume earlier. Outstanding inquiries in recent weeks have been from railroads, though as a rule the carriers are buying little. A pending list for the Santa Fe calls for about 20 tools for various shops. The Milwaukee road shortly is expected to complete buying a list of similar size.

Seattle — Inquiry for road machinery and maintenance equipment is improving. Logging operations are increasing and operators are placing supply orders. Plans of Alaska canning plants are being delayed by labor disputes and activities in this industry may be curtailed. Much of last year's pack remains unsold.

Reader Comments

(*Concluded from Page* 9)

all the miseries that accompany them.

The next six to ten years can be the greatest industrial era this country has ever seen and I am confident that our industrial boys, like "We Mon David," have the guts to make it so; they will muddle through. So, let's HOORAY for that end, and to hell with fear.

WARD A. MILLER,
Vice president,
Vanadium Corp. of America,
New York.

Construction and Enterprise

Connecticut

GREENWICH, CONN. — Sewer commissioners soon take bids for sewage treatment plant at Grass Island works. Cost to exceed $25,000. Metcalf & Eddy, 1300 Statler building, Boston, engineers.

GROTON, CONN.—Water and electric department is making preliminary survey to establish filtration plant at Popuonock bridge. Cost $25,000. A. N. Tiffany Jr., 359 Thames avenue, engineer.

HARTFORD, CONN.—Hartford Electric Light Co. is considering extensions and improvements in its distribution lines in different parts of the city and suburban areas, including additional power substation facilities and service installations. Cost $150,000.

Massachusetts

SPRINGFIELD, MASS. — City, C. W. Phillips, superintendent streets and engineering, has plans completed for three or four pumping stations. Estimated total cost, $1,500,000. Awaiting approval of plan by PWA. Metcalf & Eddy, 1300 Statler building, Boston, engineers.

Rhode Island

NEWPORT, R. I.—City board of health, city hall, receives bids to March 24 for constructing municipal incinerator, including heating and electrical work. Cost $110,000. G. B. Gascoigne & Associates, Woolworth building, New York, engineer. F. S. Boyd, 185 Thames street, Newport, consulting engineer.

New York

NEW YORK—Winfield Welding Co. Inc., Queens, was incorporated here as a machine shop with 200 shares no par value stock. Priest & Carson, 71-23 Austin street. Forest Hills, N. Y.

NORTH TONAWANDA, N. Y.—General Plastics Inc., Walck road, plans plant addition for manufacturing synthetic phenol. Cost $500,000. Private plans. (Noted in STEEL, March 14, 1938.)

NORTH TONAWANDA, N. Y. — City plans sewage disposal plant. Cost over $100,000. Owner will select engineer at once and have plans rushed to completion. Site to be selected later in 1938.

New Jersey

ALLENWOOD, N. J.—Monmouth Co., Freehold, N. J., will seek $20,246 loan from WPA for new sewage disposal plant at Allenwood hospital. County to pay $7,382 as its share. A. J. Kellenyi, Eatontown, engineer.

GLOUCESTER, N. J.—Sherwin-Williams Co., 101 Prospect avenue, Cleveland, plans pigment extraction plant on site of old Pusey & Jones shipyard. Cost including site $500,000.

NEWARK, N. J.—J. Rohm & Sons Foundry Co. Inc., Elizabeth, N. J., was incorporated here with $25,000 preferred stock and $50,000 common. Elvin H. Ulrich, agent.

NEW BRUNSWICK, N. J.—Butler Brewing Co., J. L. Butler in charge, plans reconditioning and altering former New Brunswick Brewing Co. plant. Cost $40,000.

ORANGE, N. J.—Bilhuber-Knoll Corp., 154 Ogden avenue, Jersey City, plans erecting manufacturing plant on Crane street. Plans by Ballinger Co., 105 South Twelfth street, Philadelphia.

PASSAIC, N. J.—Hygrade Food Products Corp., 30 Church street, New York, plans altering plant at 51 Central avenue. Cost $50,000.

Pennsylvania

ALTOONA, PA.—City has surveys and preliminary plans for sewage treatment plant improvements. Cost $600,000. Will design plans soon. H. J. Baum, city engineer.

HARRISBURG, PA. — General state authority, 600 North Second street, Harrisburg, receives bids April 14 at 2 p. m. for part 2 of Maximum Security prison.

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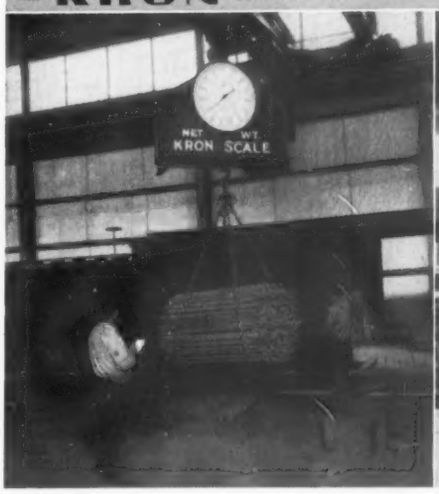


Includes power plant and engine house, sewage disposal plant, water supply system, woven wire fence. Clayton J. Lappley, architect. Henry Hornbostel, consultant architect. Total estimated cost $1,997,673. (Noted in STEEL, Feb. 28, 1938.)

PITTSBURGH — City is making preliminary plans and surveys for pure water supply system. Cost $70,000,000. C. C. Crick, 501 A, City County building, engineer in charge.

Ohio

CLEVELAND—Mackintosh Engineering Co., 2907 Library avenue, would like to purchase two 150-horsepower or smaller twin marine diesels for export.

CLEVELAND—Eaton Mfg. Co., 739 East 140th street, plans extensions and improvements to steam power house at auto equipment plant. Additional equipment will be installed. Cost $75,000. George S. Rider Co., Terminal Tower building, Cleveland, consulting engineer.

OTTAWA, O.—City plans sewage disposal plant. Cost $45,000.

READING, O.—Village council authorized employing consulting engineer to prepare plans for purchasing turbine engine. Cost $98,500.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a.m., April 5, for one electric oven, and two electric heat treating furnaces in accordance with air corps specifications 50119A dated Jan. 3, 1938. Delivery Moffett Field, Calif.

Michigan

DETROIT—Plans for an office building, machine shop and foundry to be erected for the City Pattern Works on Oakland avenue are being prepared by Norman Krecke, Detroit, architect.

Illinois

GENEVA, ILL.—City has authorized plans for new municipal electric power plant and proposes to ask for bids on equipment in the near future. Wells Engineering Co., Geneva, consulting engineer. (Noted in STEEL, Jan. 31, 1938.)

O'FALLON, ILL.—City council is arranging early call for bids on revised plans for new municipal electric power plant; includes installing engine-generator units, boilers and auxiliary equipment. Also municipal electric distribution system. Previous bids were rejected. Cost $175,000. W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, consulting engineer.

Indiana

HAMMOND, IND. — Board of public works, F. R. Martin, chairman, is making preliminary plans for sewage treatment plant. Cost $3,000,000. C. Mason, city engineer.

INDIANAPOLIS — Town has preliminary plans for constructing waterworks and distribution system, including deep well, deep well turbine pump, 75,000-gallon steel elevated tank and watermains. Cost $60,000. R. C. Lennox and J. C. Matthews, 833 Architects & Builders building, Indianapolis, engineers.

KENDALLVILLE, IND. — Kendallville Foundry Inc., Kendallville, Ind., has been incorporated to operate foundry and machine shop. The corporation has 25,000 shares no par value capital stock. William A. Maggart, Gust Busch, James G. Finley, Jacob Miller, George Steckley, John DeBelius, Henry W. Debelius, Maurice Shulze, incorporators.

SOUTH BEND, IND. — Harvell Mfg. Corp., recently formed here and incorporated will manufacture metal wastebaskets at 212 West Equing avenue. E. S. Tuttle, president. Capital stock $20,000.

WHITING, IND. — Board of public works, J. S. McNamara, chairman, is making preliminary plans for sewage treatment plant. Cost $650,000. J. Nellis, city engineer.

Alabama

COURTLAND, ALA. — City received advance grant of $4333 for preliminary survey for constructing power distribution system. Final plans and specifications to be ready for bids in two weeks. Total cost $29,000.

GUNTERSVILLE, ALA.—Gulf Refining Co. leased 10 acres near here for expansion.

RUSSELLVILLE, ALA.—City authorized issuance of $69,000 electric distribution bonds.

District of Columbia

WASHINGTON—Chesapeake & Potomac Telephone Co. has plans by Waddy B. Wood, 1227 K. street, northwest, and receives bids March 23 for alterations and additions to telephone building.

WASHINGTON — General purchasing officer, Panama canal, receives bids to 10:30 a.m., April 4, schedule 3341, for insulated cable, telephone cable, magnet wire, resistance wire, electric motors and watthour meters; delivery Cristobal or Balboa, Canal zone, Isthmus of Panama; until 10:30 a.m., April 6, schedule 3342, for boiler-feed pumps and other items, delivery Cristobal or Balboa, Isthmus of Panama, Canal zone.

WASHINGTON — Navy department bureau of supplies and accounts, takes bids to 10 a. m., March 29, schedule 3098, for two gasoline engine-driven tractors, delivery Anacostia, D. C.; until 10 a. m., April 1, schedule 3062, for motor-driven press punch, delivery Keyport, Wash.; schedule, 3065, for insulated electric cable, delivery Mare Island, Calif.; schedule 3069, for water pipe, pipe fittings and valves, delivery Mare Island, Calif.; schedule 3073, for power-driven fuel pumps, delivery Paterson, N. J., and Philadelphia; schedule 3091, for nickel-copper alloy bar, delivery Newport, R. I.; schedule 3092, for nickel-copper alloy tubing, delivery Newport, R. I.; schedule 3116, for motor generator set for electroplating and equipment, delivery Newport, R. I.; until 10 a. m., April 5, schedule 3096, for chain hoists, delivery various east and west coast points; schedule 3103, for motor-driven air compressor, delivery various east or west coast points; schedule 3105, for electric transformers, switches, cutouts, potheads, panels and relay, delivery Seattle; schedule 3107, for electric insulated cable, delivery Seattle; schedule 3110, for cocks, faucets and valves, delivery various east and west coast points; schedule 3118, for switches, rheostats, resistors, relay, indicator lights and transformers, delivery Brooklyn, N. Y.; schedule 3119, for thrust bearings for turbines, delivery various east and west coast points; schedule 3112, for upper and lower roller tracks and parts, delivery Brooklyn, N. Y., and Philadelphia; until 10 a. m., April 8, schedule 3123, for rough-machined steel forgings, delivery various east and west coast points; schedule 3132, for electric insulated cable, delivery Brooklyn, N. Y.

West Virginia

BECKLEY, W. VA.—Municipality plans erecting sewage disposal plant. Cost to exceed $25,000.

HUNTINGTON, W. VA.—International Nickel Co., John F. Thompson, executive vice president, 67 Wall street, New York, plans spending $300,000 for replacing old equipment at Huntington plant and for certain operating costs. Improvements include hydraulic ingot stripping equipment, new tube reducing machine for cold drawing. Capital expenditures in U. S. planned for 1938 total $400,000.

NEWBURG, W. VA.—Town, Edward Horchler, mayor, plans applying to WPA for funds for constructing $57,000 waterworks, town to provide $25,000 from sale of revenue bonds.

OCEANA, W. VA.—Koppers Coal & Transportation Co., Koppers building, Pittsburgh, plans installing motors and controls, electric hoists, conveyors, transformers and accessories, and other equipment in connection with development of coal mining properties in Wyoming county, West Virginia, vicinity of Oceana. Housing settlement will be established for employes. Cost $250,000.

Virginia

ALEXANDRIA, VA.—Virginia Public Service Co., Charlottesville, plans new outdoor power substation at Alexandria. Cost with transformers and auxiliary equipment, $60,000.

LOVINGSTON, VA.—Central Virginia Electric Co-operative Inc. is taking bids for erecting power lines from Afton to Tye river and from Appomattox to Gladstone. Covers approximately 112 miles in all.

Missouri

VANDALIA, MO.—City voted $145,000 bonds for municipal power plant and distribution system.

Oklahoma

ANADARKO, OKLA.—City votes April 5 on $90,000 electric light system repair bonds.

WELEETKA, OKLA.—City plans additional water supply. Cost $20,000.

Wisconsin

LA CROSSE, WIS.—Northern States Power Co. has purchased a 40-acre site on French island here and will erect new 30,000-kilowatt steam generating plant. Cost $1,500,000. Work will be started later this year. J. G. Felton, district manager.

MANITOWOC, WIS.—City plans addition to municipal garage and maintenance shops at city power plant. A. H. Zander, clerk.

Minnesota

BEMIDJI, MINN.—City will hold a special election March 29 to vote on $675,000 bond issue to finance constructing municipal power plant. Walter C. Miss, city engineer. Rose & Harris, 416 Essex building, Minneapolis, consulting engineer.

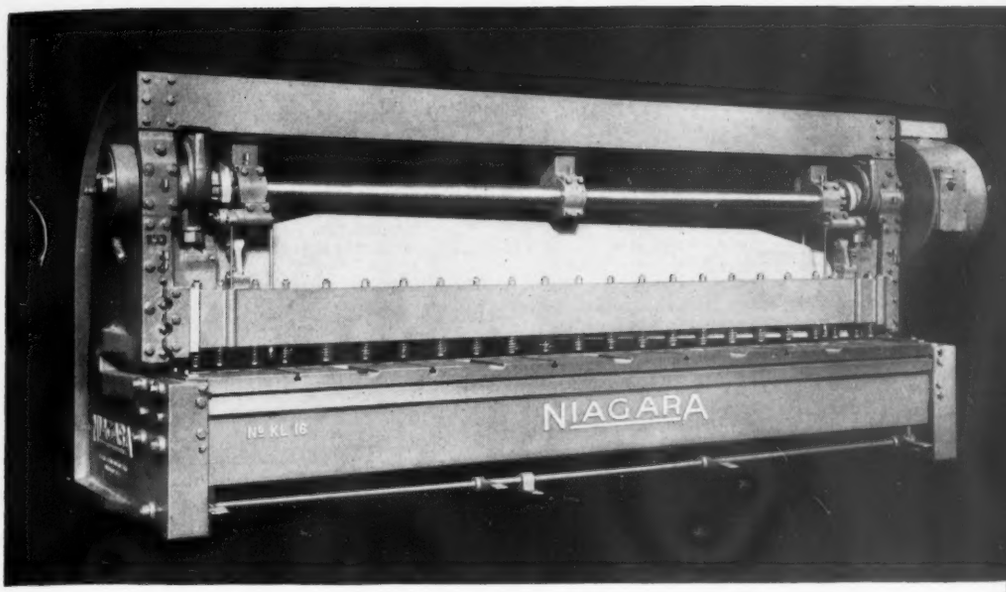
HIBBING, MINN.—Village is considering constructing sewage and garbage disposal plant. V. L. Cole, village clerk. J. C. Henry, village engineer.

ST. CLOUD, MINN.—City, Grace Atkinson, city clerk, is completing plans and will apply to WPA for funds for constructing sewage disposal plant. Cost $500,000. Buell & Winter Engineering Co., 507 Insurance Exchange building, Sioux City, Iowa, consulting engineer.

ST. PAUL—Board of water commissioners, H. W. Austin, purchasing agent, is taking bids to 2 p. m., April 12, for constructing filtration plant addition at McCarron pumping station.

Texas

AUSTIN, TEX.—Texas Public Service



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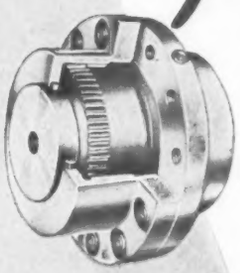

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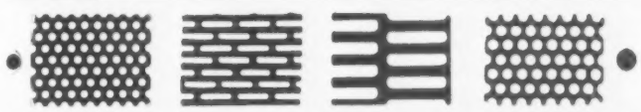

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Co., 907 Congress street, will spend $251,201 during 1938.

ELECTRA, TEX.—City voted $122,800 bonds for constructing generating plant and electric distribution system. A. B. Corder, mayor. Joe E. Ward, Harvey-Snider building, Wichita Falls, engineer. (Noted in STEEL, Jan. 17, 1938.)

HOUSTON, TEX.—Tennison Mfg. Co., Major Edward W. Kelley, 1901 Franklin street, acquired 56 acres in east end for erection of metalworking plant. Cost $450,000.

LIBERTY, TEX.—City, Tom Calhoun, mayor, applied to PWA for increase in loan and grant from $95,000 to $127,000. Includes three 150-kilowatt generators, power plant, switchboard and distribution system. Garrett Engineering Co., Box 1726, Houston, engineer. (Noted in STEEL, Feb. 14, 1938.)

ROBSTOWN, TEX.—City will have plans ready for bids about May 1 for light and power system and gas system. Garrett Engineering Co., Box 1726, Houston, engineer.

SUNRAY, TEX.—Panhandle Power & Light Co., Borger, Tex., has approved plans for new steam electric generating plant at Sunray for service in local oil field area. Transmission lines will be extended as will power substation facilities. Cost $200,000.

TEXAS CITY, TEX.—Carbide & Carbon Chemicals Corp., 30 East Forty-second street, New York, acquired tract of 200 acres for constructing chemical plant. First unit to cost $4,000,000.

WEATHERFORD, TEX.—City, W. C. Hart, mayor, plans installing water softening equipment at water plant. Cost $20,000.

WICHITA FALLS, TEX.—Sunray Oil Co., Philtower building, Tulsa, Okla., and Phillips Petroleum Co., Bartlesville, Okla., plan installing compressors, motors and controls, electric-operated pumping machinery, conveyors and other equipment in new gasoline refining plant to be constructed jointly in vicinity of Wichita Falls. Cost about $500,000.

Kansas

CLAY CENTER, KANS. — City plans water softener plant in connection with municipal light and water system. Election in spring for same.

Iowa

ANAMOSA, IOWA—Plans have been approved for constructing a sewage disposal plant shortly by state board of control, E. H. Behrens, Des Moines, chairman, and the city. Howard R. Green, 417 First avenue, southeast, Cedar Rapids, consulting engineer.

BOONE, IOWA—Iowa Electric Light & Power Co., Cedar Rapids, has filed application with Iowa state commerce commission for permission to construct transmission lines in Boone and Jones counties.

DAKOTA CITY, IOWA—City will hold an election March 28 on a $3500 bond issue to finance constructing filtration plant.

DURANT, IOWA—Common council is considering constructing new municipal electric power plant. Estimated cost $100,000. Bond issue to be arranged.

HOLSTEIN, IOWA—City is drawing up plans to be completed soon for constructing sewage plant consisting of Imhoff tank, rock filter, gravity plant, 1000-foot 10-inch outlets. Will take bids about April 20. Buell & Winter Engineering Co., Insurance Exchange building, Sioux City, Iowa, consulting engineer.

MASON CITY, IOWA—Peoples Gas & Electric Co., 22 Second, northwest, will construct power substation. Cost about $40,000.

MASON CITY, IOWA — City is seeking PWA funds for steel tank on tower, new turbine pump and watermain extensions. Cost $120,000. Maturity indefinite. C. H. Stevens, Mason City, engineer.

MENLO, IOWA—Town, W. R. Glover, mayor, is considering constructing waterworks plant including pump and motor unit, manual distant control and switch, and miscellaneous equipment.

WATERLOO, IOWA—Iowa Public Service Co., Waterloo, has filed application with the Iowa state commerce commission for permission to construct 38 miles electric transmission lines in Black Hawk, Bremer, Tama and Floyd counties. H. E. Howell, engineer.

WHITTEMORE, IOWA—City, R. H. Finnell, city clerk, will hold a special election March 28 to vote on issuing $2800 bonds to finance replacement of riser pipe on water tank and installing new pump.

Nebraska

COLUMBUS, NEBR.—Loup River Public Power District, Harold Kramer, secretary, 2307 Thirteenth street, has been granted permission by state railway commission to construct 123 miles rural transmission lines in Colfax county. Harza Engineering Co., 205 West Wacker drive, Chicago, consulting engineer. (Noted in STEEL, Jan. 10, 1938.)

HARTINGTON, NEBR. — Cedar-Knox Rural Power District, M. L. White, secretary, is taking bids to 7:30 p. m., April 8, for furnishing 390 meters and meter sockets as per specifications on file with consulting engineer. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

KEARNEY, NEBR.—Application has been filed with the state railway commission by the Buffalo County Rural Public Power District, Alvah G. Zimmerman, president, for permission to construct 114 miles rural transmission lines in Buffalo county. Hearing will be held April 7. Robert Fulton, 2327 South Nineteenth street, Lincoln, consulting engineer.

WEST POINT, NEBR.—Cuming County Rural Public Power District, J. R. Watson, takes bids to 10 a. m., April 8, for 490 meters and meter sockets as per specifications on file with consulting engineer. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha.

WEST POINT, NEBR.—Permission has been granted by state railway commission to Cuming County Rural Public Power District, Claude E. Galbraith, president, to construct 230 miles rural transmission lines in Cuming, Stanton and Burt counties. Cost $250,000. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

YORK, NEBR.—Voters at March 16 election approved plan to acquire municipally owned light plant and distribution system. If unable to negotiate purchase of private plant, city will construct a new plant with three diesel engines and distribution system. Estimated cost $475,000. Robert Fulton, 2327 South Nineteenth street, Lincoln, consulting engineer. (Noted in STEEL, March 7, 1938.)

Colorado

RYE, COLO.—City is considering municipal electric distribution system with power source from Huerfans county municipal district, 16 miles away. Would include constructing transmission lines to such point or to electric power station. Estimate of cost will be made. Robert Totten, Rye chamber of commerce, project head.

Montana

KALISPELL, MONT.—Bids will be received until April 7 for the first unit Flathead REA project, 125 miles long. Funds available total $144,000.

Utah

DELTA, UTAH — Town plans new water supply system, source to be deep wells and pumping system. Cost $20,000. Engineer not appointed.

Pacific Coast

EL TORO, CALIF. — Moulton & Co., El Toro, is completing plans for concrete earth dam and 1800-gallons-per-minute pumping plant and conduits. Cost over $75,000.

LONG BEACH, CALIF.—Building permits have been issued to Richfield Oil Corp., Union Pacific railroad and General Petroleum Corp. for constructing one steel oil derrick for each company. Total cost $30,000.

LOS ANGELES—A 3½-acre site at Soto and Lugo streets, Los Angeles, has been purchased by Utility Fan Corp., 2528 Santa Fe avenue, for use in its expansion program in which $50,000 will be spent for new equipment.

LOS ANGELES—Gaffers & Sattler, gas heater and range manufacturers, 4561 East Fiftieth street, have acquired two-story building to be used for manufacturing space.

REDDING, CALIF. — City council takes bids about March 28 for constructing first unit of water distribution system, including intake tower, wetwell, tunnel, pump houses and equipment, transmission lines from river and reservoir. Cost $102,000. W. K. Adams, city engineer.

SANTA PAULA, CALIF. — City, W. R. Ramsey, plans calling bond election, probably immediately, to finance constructing new sewage disposal plant to replace one destroyed by recent flood. Cost $50,000 to $75,000.

HOOD RIVER, OREG.—Hood River Apple Growers association has voted to rebuild Cascade washing plant damaged by fire last December.

SEATTLE—American Can Co. is making improvements at its Seattle offices. Cost $60,000.

SPOKANE—Spokane Valley Canning Co. has taken option on two local sites and plans erecting canning plant with annual capacity of 125,000 cases. Cost $30,000.

SPOKANE—Inland Empire Refineries Inc., organized by W. H. McIntyre Jr., Salt Lake City, president, plans constructing modern refining plant to handle crude oil from Cut Bank, Mont., field. Site has been selected.

Canada

FERRIS, ONT. — Town plans water supply system. Cost $35,000. J. Pasmore, clerk.

KITCHENER, ONT.—City council plans improving Doon road sewage disposal plant including installing dehydrating equipment. Council interested in prices and information. Cost $30,000. S. Shupe, city hall, engineer.

ROUYN, QUE.—Aldermac Copper Corp. soon takes bids for constructing sulphur plant. Cost $500,000. Engineer, care of owner.

Have You Seen This HELPFUL LITERATURE?

Here are the latest industrial publications reviewed for your benefit. They are yours for the asking. There is no charge or obligation. Simply fill in the convenient coupon and return.

Lathes 1

R. K. LeBlond Machine Tool Co.—"What Makes Main Street," a 54-page spiral bound booklet commemorating company's fifty years of service building lathes. It presents features and specifications of complete line and gives interesting institutional description of the influence of such modern machinery on the typical Main street. Formerly sold at 25 cents per copy, it is now offered free of charge to readers of STEEL.

Drive Chains 2

Jeffrey Mfg. Co.—2 color 24 page catalog 645 showing applications and illustrations of drive chains. Tables show prices, weight, ultimate strength, material, dimensions and complete information on each chain number. Links are illustrated life size up to ultimate strength of 225 tons. Sprockets are included.

Streamliners 3

Pullman-Standard Car Mfg. Co.—12 page 2 color reprint of article on new streamliners for Pacific coast service. Excellent photography shows inside and outside views of trains. Last section shows latest types of Pullman freight, ore, gondola, refrigerator and standard passenger cars.

Die Metal 4

Advance Foundry Co.—4 page 2 color folder on cost-reducing die metal. Runs as high as 750,000 are claimed to have been reached with dies cast by this formula.

Stainless Steel 5

Rustless Iron and Steel Corp.—60 page 2 color complete handbook for fabricators of stainless steel. Included are descriptions of all types, complete data on alloy content, general processing instructions and engineering data. Latter section includes corrosion resistance table, comparative hardness conversion values, strength of ferrous and nonferrous metals, and conversion tables showing fractional inches into decimals and millimeters, and fahrenheit into centigrade.

Salt Bath Furnace 6

Ajax Electric Co.—4 page 2 color folder 103 introducing entirely new type salt bath furnace different from externally or internally heated furnaces in that patented arrangement of electrodes in salt bath utilizes electromagnetic forces to provide automatic stirring action. Principle is claimed to be better adaptation for cyaniding, hardening, annealing and tempering. Working drawings and table are included.

Pumps 7

Aldrich Pump Co.—data 50 is 20 page compact booklet of tables valuable to hydraulic engineers. Included are general information and charts of all kinds pertaining to hydraulics. Respective recommendations of material for handling 132 different liquids are listed. Data 41 is 6 page folder on high-speed pumps, first motion and geared. Data 75 is a 6 page folder of marine pumps.

Regulators 8

Spence Engineering Co.—20 page condensed catalog showing various types valves and regulators. Blueprints, working drawings, and cut away photographs explain intricate operation. Gas and water flow graphs, tables, and complete instructions are given.

Stainless Steel Flux 9

Ruby Chemical Co.—4 page 3 color folder on new soldering flux for stainless steel. Illustrations and prices are given.

Titanium 10

Titanium Alloy Mfg. Co.—32 page handbook-text explaining in complete and authoritative detail the effect of titanium on steel. Tables show test comparison between titanium and untreated steels.

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HELPFUL LITERATURE

Electric Cables 11

Anaconda Wire & Cable Co.—16 page handbook on application, physical properties and construction of metallic cables. Various charts show complete details of operation and cable splicing instructions are included.

Locomotives 12

Cooper-Bessemer Corp. — 2 color folding spread on new diesel electric locomotives, showing change between old and modern styles.

High-Tensile Steel 13

United States Steel Corp.—68 page 2 color booklet on Cor-Ten showing mainly wide usage in railroad cars and busses. Complete tables, data and information on physical properties, comparative tests and fabrication are included. Five page table of applications in railroad industry and 5 pages of bibliography covering articles and references to USS High-Tensile steels in trade publications over past 5 years is presented.

Motors 14

Crocker-Wheeler Electric Mfg. Co.—8 page 2 color booklet explaining and illustrating polyspeed motors. It contains construction information and list of suggested applications.

Doors 15

Kinnear Mfg. Co.—24 page catalog No. 19 illustrates various types of doors. Included are home and industrial, rolling and bifolding types, market, jewelry, shop and bank grilles, and automatic closing fire doors and windows. Various tables show complete working specifications.

Valves 16

Ashton Valve Co.—catalog covering industrial gages. It includes large line of valves with illustrations, specifications and engineering information.

Automatic Controls 17

Mercoid Corp.—32 page catalog 100 F, giving description and prices of thermostatic and pressure automatic controls for liquids and gases. Electrical controls and switches are also described.

Foundries 18

Beardsley & Piper Co.—36 page booklet on experiences encountered in a 40,000 mile trip visiting foundries in all parts of the world. Numerous illustrations are shown.

Tar Dehydrator 19

Semet-Solvay Engineering Corp.—10 page 2 color booklet on R. S. De-Emulsifier which offers "a practical and economical solution to the problem of disposing of tar emsulsions formed in the manufacture of water gas. The equipment treats tar emulsions of all types and dehydrates the tar to a degree that makes it merchantable for various uses or suitable for boiler fuel." Flow diagram and operating cost table are included.

Mercury Lighting 20

Westinghouse Electric and Mfg. Co.—folder illustrating application of high intensity mercury lighting in industrial plants. Complete list of products and accessories for both mercury and combination mercury incandescent units are included.

Steam Traps 21

Yarnall-Waring Co.—10 page 2 color bulletin T-1733 on impulse steam traps. Trap has one moving part and no levers, buckets, weights, bellows or floats. Prices, tables, drawings, construction details and section on how to select steam traps are given. Numerous applications are illustrated.

Electric Products 22

Bull Dog Electric Products Co.—88 page catalog and price list of all types electric equipment. Descriptions and illustrations of switches, lighting panels and cabinets are included.

Stainless Steels 23

American Rolling Mill Co.—16 page booklet on stainless and heat resisting steels. It gives the analysis and average physical properties of each type and illustrates typical applications.

Ropes and Slings 24

John A. Roebling's Sons Co.—83 page booklet on wire rope and grommet slings. Variety of photographs shows wide applications in shop and field. Lift tables, diagrams and complete information are given.

Ingots 25

H. Kramer & Co.—79 page fiftieth anniversary data booklet-catalog on ingot products including red brass, manganese bronze, yellow brass, aluminum bronze and nickel silver, and also special metals and alloys.

Strip 26

Jones & Laughlin Steel Corp.—60 page book on new 96-inch continuous strip mill. Numerous photographs illustrate all phases of operation and line drawings show representative products. Glossary of mill terms, construction statistics, mill elevation plan and several color reproductions of oil paintings in mill are included.

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Electric Cable 1

Anaconda Wire and Cable Co. — Publication C-39 describes the characteristics of ANW cable, now acceptable by the National Electrical Code for installation under conditions formerly requiring lead covered cable. Includes data on diameters and weights. Unusual treatment of illustrations explains advantages.

Bearings 2

Johnson Bronze Co. — A 64 page catalog packed with useful data and information on all types of bronze bearings and bearing metal. Contents include general purpose bearings, electric motor bearings, graphited bronze, babbitt-lead base and tin base metal, hexagon bar bronze, oil grooving, alloy, etc. Includes information on complete line of Johnson bearing bronze and bearings.

Batteries 3

Gould Storage Battery Co.—48 page 2 color catalog-bulletin No. 138 on batteries for stationary applications. Complete engineering data including operating charts, drawings and details are given for 3 lines of batteries produced. Performance is guaranteed for 14, 10 and 8 years respectively on the 3 lines.

Contour Machining 4

Continental Machine Specialties—64 page 2 color book entitled "25 Ways to Cut Machining Costs." Part I is devoted to specific jobs formerly done by nibbling, milling, shaping, torch cutting and slotting, now done on band-saw contour-cutter. Part 2 is technical explanation given by reprints from articles in trade magazines. Part 3 contains numerous testimonial letters and part 4 includes data pages, and chart of percentage of time saved on a variety of typical applications. Book is widely illustrated with photographs of machine in operation and products turned out.

Strip Mill 5

Republic Steel Corp.—8 page 2 color reprint shows numerous scenes in their new 98-inch hot and cold strip mill. Booklet contains aerial photographs of location before moving river half mile to provide for plant and illustration after plant was completed. Mill operating statistics are included also illustrations of finished sheet and strip products.

Rivet Heaters 6

American Car and Foundry Co.—4 page 2 color bulletin on electric rivet heaters. Comparison tables of electric and oilburner-heated rivets show fuel savings, less wastage of material and faster production with electric heaters.

Welding Electrodes 7

The McKay Co. — A 14 page folder on a new line of McKay shielded-arc welding electrodes, giving information on analysis, and operating characteristics of seven different rods. Full information on uses of the different rods is included.

Conveyers 8

Mathews Conveyer Co.—108 page handbook of engineering data for specifying material handling equipment. Illustrations include 28 types of roller conveyers, 20 frame designs and supports for these conveyers, 30 ball bearing wheel conveyers, 7 ball transfers, 4 turntables, dollies and chain, gear and belt driven live roller conveyers. Specific and detailed drawings and tables illustrate each product.

Screws 9

American Screw Co.—6 page 4 color folder on screws with patented recessed heads. Illustrations point out advantages of this type of screw over conventional slotted screws. Variety of hand and machine driven drivers are shown.

Valves 10

Homestead Valve Co.—6 page 2 color folder on lift plug valves. Working drawings, advantages, typical uses and information for ordering valves is included.

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HELPFUL LITERATURE

Bearings 11

Hyatt Bearings Div. General Motors Corp.—24 page 4 color booklet entitled "Your 10 Demandments are the Hyatt 10 Commandments." Booklet lists 10 necessary qualities of bearings and graphic illustrations show how Hyatt has achieved them.

Induction Motors 12

Century Electric Co. — Automatic start induction polyphase motors are illustrated and described in detail in a 2 color, 4 page bulletin, No. 1066. Information on construction and operating characteristics is given.

Spot Welding 13

Progressive Welder Co. — Portable hydraulic welding guns and equipment are illustrated in actual use in this 8 page, three color Bulletin No. 3802. Various adaptations for special spot welding jobs are shown and shop photos of the equipment in use are included.

Clutches 14

Rockford Drilling Machine Div. Borg-Warner Corp.—4 page 2 color folder No. OC100 on over-center clutches. Keyed working drawing points out features and advantages. Illustrations and descriptions of power take-offs and spring-loaded clutches are included.

Gear Finisher 15

Michigan Tool Co.—6 page 2 color folder on new model 860 gear finisher. Complete specifications, illustrations and information are given. A list of company products is included.

Die Steel 16

Wm. Jessop and Sons, Inc. — An interesting discussion of Alloy "C", a high carbon, high chromium steel. Its principal uses and methods of working are discussed at length.

Arc Welding 17

Harnischfeger Corp.—10 page bulletin No. W20 entitled "New Advances in Arc Welding Equipment Design." It presents an outline of the modern goal in arc welding equipment design and welding technique. Charts, graphs, line drawings, photographs and photomicrographs illustrate product, methods and results.

Instruments 18

Bausch & Lomb—32 page catalog 225 illustrating metallographic equipment and supplies. It contains complete description and prices on industrial microscopes, photomicrographic cameras and accessories. Included is large list of users and a bibliography of metallurgy.

Reducers 19

Stephens-Adamson Mfg. Co.—12 page 3 color catalog 68 on variable reducer transmission. Cross section working drawing explains operation. Catalog contains reproduced blueprints, working tables and charts and numerous illustrations showing wide applications.

Circuit Breakers 20

General Electric Co.—bulletin No. 2450A on air circuit breakers, used for protecting low-voltage electric circuits in central station, industrial, and building equipment service. Connection diagrams, dimensions, and working specifications are included.

Motor Generator Sets 21

Allis-Chalmers Mfg. Co.—20 page, two color Bulletin 1155A, profusely illustrated with shop and installation pictures of motor generator sets. Data is presented on application of different types of units, including direct current generator, synchronous motor, induction motor-generator flywheel sets, frequency changer sets, and sets of special construction. Construction details are given.

Pipe 22

Bethlehem Steel Co.—4 page 2 color folder No. 392 on fatigue-resisting pipe for railroads. Photographs show bending, welding, threading and testing operations and products after tests.

Centrifugal Pumps 23

Gould's Pumps Inc.—bulletin No. 210 describes new line of single stage, side suction, ball-bearing centrifugal pumps. It includes construction data, performance tables, and complete technical information.

Bearings 24

Shafer Bearing Corp.—Catalog No. 14, well illustrated, gives complete information on radial-thrust roller bearings, and self-aligning ball and roller bearings for all types of industrial and machine applications. Specifications, tables and engineering data are included. A complete price list, keyed to the catalog is also available.

Refractory Lagging 25

Quigley Company, Inc.—Bulletin 327-A is an interesting informative 4 page discussion of Insulag, a refractory lagging for temperatures up to 2200 deg. F. Illustrations show methods of application, and accompanying tables provide full information on properties and required thicknesses for given temperatures. Other insuline products are also described briefly.

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Corrosion Prevention 1

Alox Corp.—This 32 page booklet discusses the theory and high cost of corrosion in iron and steel, and by means of charts, tables and comparative information shows the value of Alox as a practical method of corrosion-prevention. Several Alox compounds are available and the characteristics of each are presented. Government reports and experiences of industrial users are quoted. Indicated applications for each of the several compounds are given.

Screws 2

American Screw Co.—6 page 4 color folder on screws with patented recessed heads. Illustrations point out advantages of this type of screw over conventional slotted screws. Variety of hand and machine driven drivers are shown.

Alloys 3

International Nickel Co.—"Six Minutes with Six Metals" is the title of a new two color, 16 page booklet describing typical applications, unusual applications and characteristics of Monel, "K" Monel, "R" Monel, Inconel, nickel, and "S" Monel castings. Mechanical properties of Monel, nickel and Inconel are given in detail. The last page is devoted to a list of the various physical forms in which these metals can be secured from stock.

Conveyors 4

The Alvey-Ferguson Co.—1938 catalog. A colorful presentation of data and illustrations covering its line of gravity conveyors. This book describes four general classifications of gravity units, pictures typical installations in steel and metalworking as well as in other industries, and includes blueprint drawings of details of various roller types and other useful information.

Gear Finisher 5

Michigan Tool Co.—6 page 2 color folder on new model 860 gear finisher. Complete specifications, illustrations and information are given. A list of company products is included.

Valves 6

Vickers Inc.—Bulletin 36-6 illustrates the series 400 and 1400 balance valves. Perspective photographs and dimensioned blueprints of eight different types accompany descriptive information. One of the important features of these series of valves is their hydraulic balance.

Die Steel 7

Wm. Jessop and Sons, Inc.—An interesting discussion of Alloy "C", a high carbon, high chromimum steel. Its principal uses and methods of working are discussed at length.

Lathes 8

The Monarch Machine Tool Co.—"Let's Take a Look at Monarch" is the title of a unique, oversize picture trip through this company's plant. Particularly striking illustrations show practically every step in the manufacture of Monarch lathes. 28 pages are devoted to piece by piece design, construction, testing and shipping of the product. The last page includes a list of other Monarch machine tools.

Floor Plate 9

The Alan Wood Steel Co.—Eight page folder on "A. W." rolled steel floor plate. Full sized photographs show the non-skid tread of super-diamond, standard diamond, and diamondette floor plate. Complete tables of sizes, gauges and weight accompany each illustration. Helpful charts for determining safe concentrated load and deflection on rolled steel plate are included.

Hoists 10

American Engineering Co.—Here is a 28 page book crammed full of photographs, tables and blueprints of Lo-Hed Hoists. One valuable feature of the publication is the section devoted to discussion on proper methods of selecting hoists, and determining the best types to accomplish the job. Many actual industrial installations are pictured.

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HELPFUL LITERATURE

Bearings 11

The Torrington Co.—This 12 page booklet is composed principally of reproductions of advertisements describing Torrington needle bearings. This series of advertisements was recently cited for honorable mention in the annual advertising awards, a national competition. Application illustrations showing the use of needle bearings, as well as descriptions of their characteristics are given.

Copper-Silicon Alloys 12

Revere Copper & Brass, Inc.—64 page book on Herculoy. This informative book through comprehensive charts, tables and photomicrographs of grain structures and numerous photographs shows industrial applications of this alloy. Eight pages are devoted to valuable tables for use of estimators. One in particular gives all principal characteristics, chemical and physical properties of Revere alloys in their various forms.

Motor Generator Sets 13

Allis-Chalmers Mfg. Co.—20 page, two color Bulletin 1155A, profusely illustrated with shop and installation pictures of motor generator sets. Data is presented on application of different types of units, including direct current generator, synchronous motor, induction motor-generator flywheel sets, frequency changer sets, and sets of special construction. Construction details are given.

Alloy 14

Wilcox-Rich Div., Eaton Mfg. Co.—"Hard Facts" is the title of a monthly bulletin describing Xaloy, its characteristics and applications. In addition to interesting illustrations, a questions and answers department covers many phases of Xaloy's use.

Steel Chairs 15

The Harter Corp.—3-color, 8 page booklet on the Cavalier Suite of office chairs. This line is the newest development in scientifically designed, streamlined chairs for office use. They are in complete harmony with modern office trends.

Bearings 16

Johnson Bronze Co.—A 64 page catalog packed with useful data and information on all types of bronze bearings and bearing metal. Contents include general purpose bearings, electric motor bearings, graphited bronze, babbitt-lead base and tin base metal, hexagon bar bronze, oil grooving, alloy, etc. Includes information on complete line of Johnson bearing bronze and bearings.

Packing 17

United States Rubber Co.—"Industry's Preferred Eleven" is an interesting 16 page booklet illustrating and describing 11 types of packing that have been found to fulfill most industrial requirements. Recommendations are made for application of each of these various packings and information is given on sizes and forms in which they are available. A useful table shows various types of packing that are recommended under given conditions of service.

Incandescent Lamps 18

Westinghouse Electric & Mfg. Co.—A new 16 page booklet on "How to Judge a Lamp," explains the methods of figuring light costs. Steps in the manufacture of lamps are illustrated and described and a table at the end of this interesting booklet gives a list of defects that impair lighting qualities and efficiency of incandescent lamps.

Skids and Pallets 19

The Mullins Mfg. Corp.—New loose leaf catalog No. 6. This catalog includes data and illustrations covering several recent additions to the company's line. One such item is a new tiering storage unit designed for operation with an electric fork truck. Another is a new design of all-steel box truck for similar operation with fork trucks. Then there are drawings of new pallets, on a reversible, solid type unit with corrugated platform; another flat type pallet with reinforced panels; a third a reversible wood-steel pallet. This catalog also covers the remainder of the materials handling equipment of the division.

Bearings 20

Shafer Bearing Corp.—Catalog No. 14, well illustrated, gives complete information on radial-thrust roller bearings, and self-aligning ball and roller bearings for all types of industrial and machine applications. Specifications, tables and engineering data are included. A complete price list, keyed to the catalog is also available.

Spot Welding 21

Progressive Welder Co.—Portable hydraulic welding guns and equipment are illustrated in actual use in this 8 page, three color Bulletin No. 3802. Various adaptations for special spot welding jobs are shown and shop photos of the equipment in use are included.

Welding Electrodes 22

The McKay Co.—A 14 page folder on a new line of McKay shielded-arc welding electrodes, giving information on analysis, and operating, characteristics of seven different rods. Full information on uses of the different rods is included.

Rings 23

King Fifth Wheel Co.—Eight page, two color booklet on welded steel rings and flanges. Illustrations show various types of flats, angles, tees, channels, squares and rounds that can be formed in sizes up to diameters of 100 feet.

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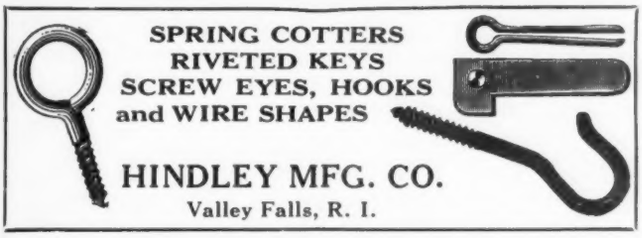

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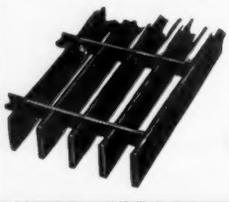

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Wilcox, Crittenden & Co., Inc. ..... —
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Worth Steel Co. ..... —
Wyckoff Drawn Steel Co. ..... —

Y

Yale & Towne Mfg. Co. ..... —
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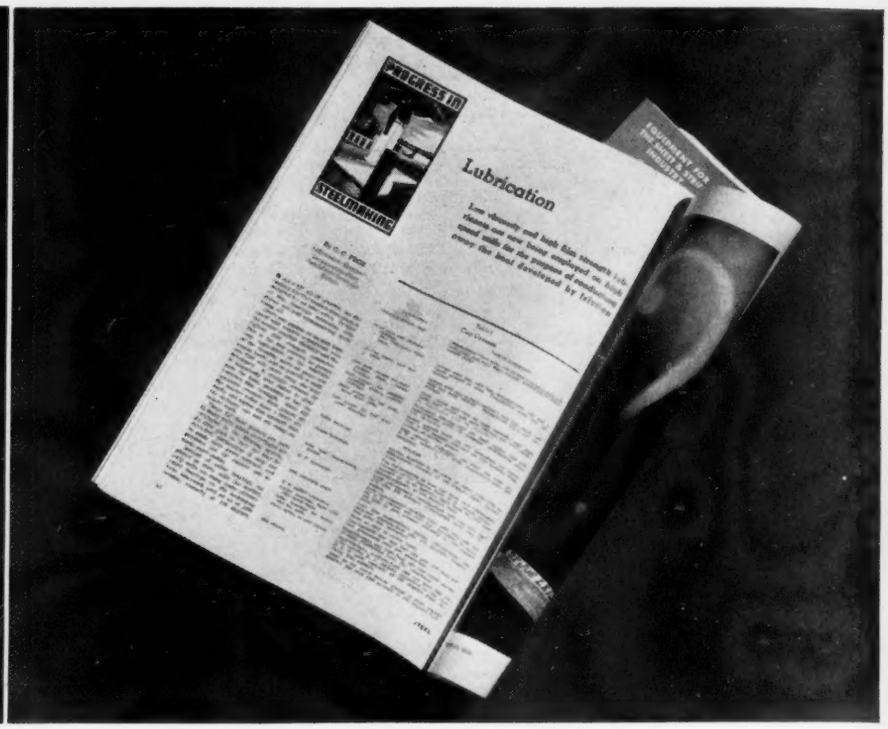
Zeh & Hahnemann Co. ..... —

IN STEP WITH PROGRESS



"Progress in Steelmaking", a regular feature of STEEL, is devoted to the latest practice in iron and steel production, embracing blast furnace, steelworks and rolling mill operations.

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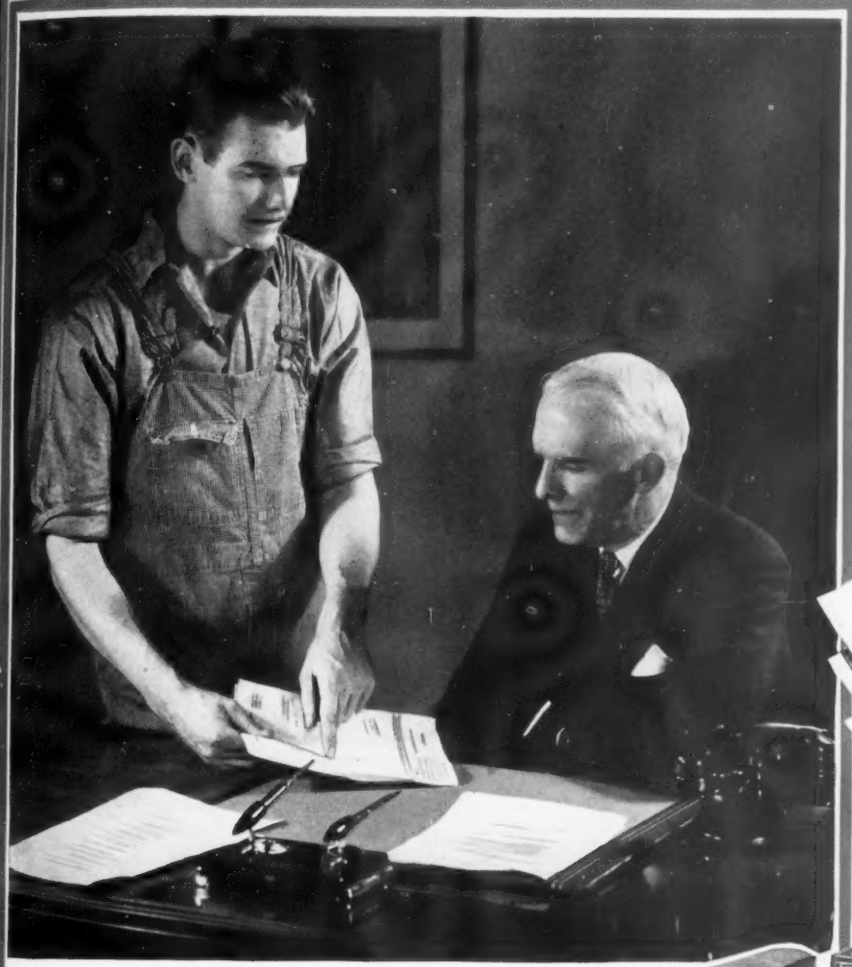

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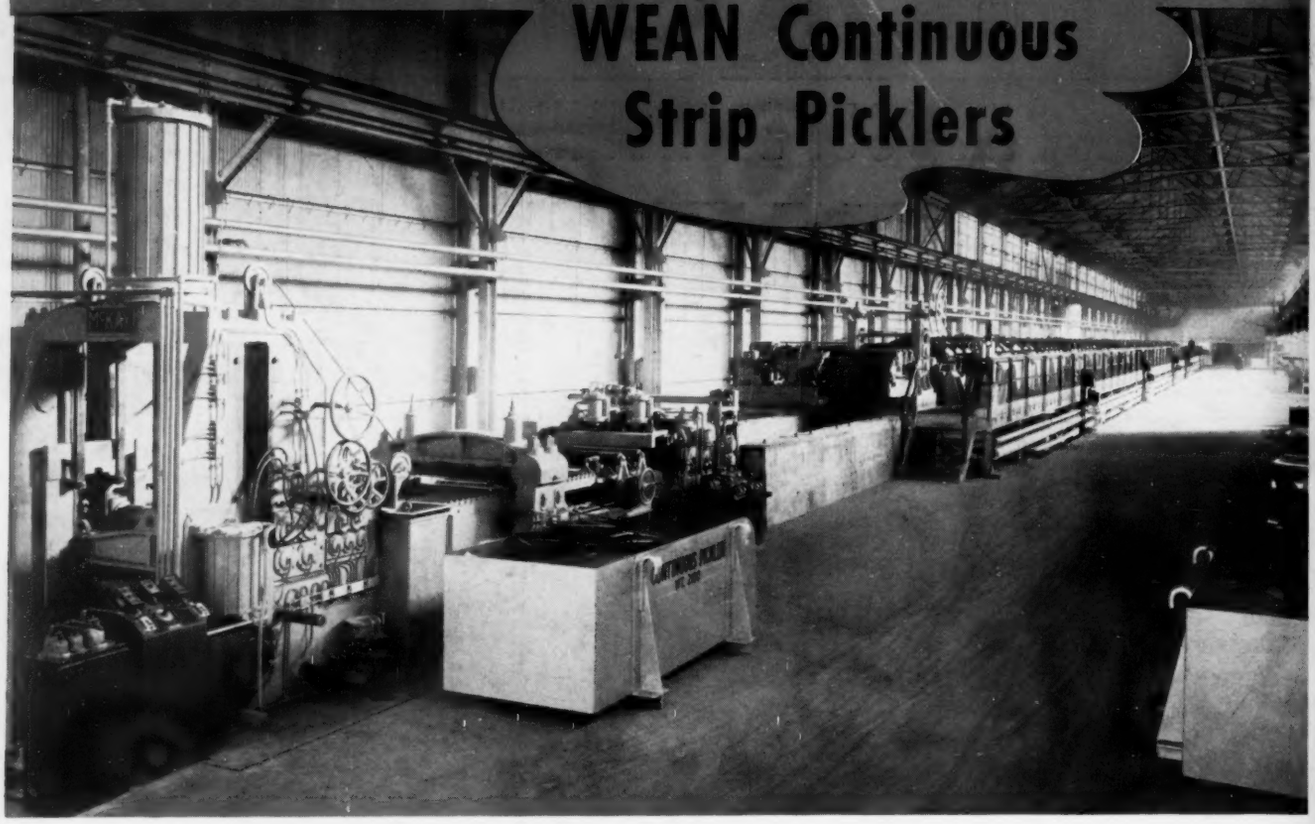

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